FLORENCE COPPER

FLORENCE COPPER INC.
1575 W. Hunt Highway, Florence, Arizona 85132 USA
florencecopper.com

September 15, 2020

Ms. Nancy Rumrill
U.S. Environmental Protection Agency, Region 9
Drinking Water Protection Services, WTR-3-2
75 Hawthorne Street
San Francisco, California 94105

Re: Transmittal of Supplemental Information in Support of Application for Underground Injection Control (UIC) Permit, Florence Copper Project, Florence, Arizona

Dear Ms. Rumrill:

Pursuant to our telephone conversation on September 10, 2020, Florence Copper Inc. (Florence Copper) herewith transmits supplemental information in support of our application for an Underground Injection Control (UIC) Permit submitted to the U.S. Environmental Protection Agency (USEPA) on October 4, 2019 (Application). The information transmitted herewith reflects our understanding of and response to questions the USEPA has regarding previously submitted Application materials.

Each of the sections below begins with our stated understanding of the additional information required by the USEPA, followed by our response which includes references to the attached materials.

Request 1:

The USEPA requested additional information regarding the distinction between annular conductivity (ACD) monitoring conducted to evaluate mechanical integrity of Class III well casings and ACD monitoring conducted to detect vertical migration of injected fluid.

Response 1:

Florence Copper has proposed to install two ACDs on each well at the limits of the exempted aquifer. One ACD will be installed at a point 10 feet below the middle fine-grained unit (MFGU), and a second ACD will be installed no more than 10 feet above the MFGU. In areas where the MFGU lies more than 200 feet above the bedrock/lower basin fill unit (LBFU) contact, an ACD will be installed no more than 190 feet above the bedrock/LBFU contact, and a second ACD will be installed no more than 210 feet above the bedrock/LBFU contact. The ACD design is shown on Figure C-4 of the Application.

The proposed ACDs will be used to monitor Part 2 mechanical integrity and to monitor vertical migration of injected solution if such were to occur. The proposed ACD installation described above will result in three ACDs installed on every injection, recovery, observation, and perimeter well. ACDs will also be installed on monitoring wells constructed within the Area of Review (AOR).

For the purpose of mechanical integrity monitoring, the ACDs are used to monitor fluid migration in the event that a micro-annulus were to form between the fiberglass well casing and the cement seal. Injected fluid migrating through the micro-annulus would complete the circuit between two ACDs installed 1 meter apart.

For the purpose of monitoring vertical migration of injected fluid, the ACDs would detect upward migration of fluid through the formation. Injected fluid migrating upward through the formation would contact the arms of the ACD which are in contact with the formation and would close the circuit between the arms of two ACDs installed 1 meter apart.

Both fluid migration through a micro-annulus and upward vertical migration of injected fluid through the formation would generate a similar signal from an individual ACD. The distinction between the two events is based on the wellfield configuration and well spacing.

The failure of a cement seal, resulting in the development of a micro-annulus occurring in a single well, would generate signal from that well alone. Because the injection and recovery wells are spaced so closely together (71 feet), vertical migration of injected fluid would generate a signal from multiple adjacent wells at once, reflecting a growing mound of injected fluid. The contingency actions associated with each of these hypothetical conditions are described below.

Contingency Actions in Response to ACD Monitoring Signals

Complete the following contingency actions in response to an above-background signal from an ACD installed on a single well, which indicates possible loss of mechanical integrity.

1. Remove well from service.
2. Perform standard annular pressure test to evaluate mechanical integrity.
3. Complete temperature log, nuclear magnetic resonance log, and dual induction logs to evaluate potential fluid movement outside of the well casing.
4. Repair the well.

Complete the following contingency actions in response to an above-background signal from individual ACDs installed on two or more adjacent wells, indicating possible mounding and upward migration of injected fluid.

1. Remove the wells from service.
2. Reduce the injection rate at adjacent injection wells by 50 percent or more.
3. Increase recovery of injected fluid at adjacent recovery wells.
4. Increase the frequency of ACD monitoring to weekly.
5. Perform standard annular pressure tests on the subject wells to evaluate mechanical integrity.
6. Complete temperature log, nuclear magnetic resonance log, and dual induction logs on the subject wells to evaluate potential fluid movement outside of the well casing.

Bulk conductivity monitoring conducted during Production Test Facility (PTF) operations has demonstrated that the planned injection pressures and flow rates do not induce development of micro-annuli or result in the vertical migration of injected fluid. Florence Copper understands that the

USEPA intends to require a demonstration of the effectiveness of the ACDs to monitor for the presence of injected fluid.

Request 2:

The USEPA requested additional information regarding maintenance of hydraulic control during rinsing of resource blocks where copper recovery has been completed, while copper recovery is ongoing in other areas of the wellfield.

Response 2:

Florence Copper will maintain hydraulic control of the active In-Situ Copper Recovery (ISCR) wellfield area throughout operations. The active ISCR wellfield is defined as the area where injection, recovery, observation, and perimeter wells have been installed and are in use for injection, recovery, rinsing, or water level observation. ISCR wells that are undergoing rinsing remain subject to the requirement of hydraulic control. Consequently, Florence Copper will maintain hydraulic control at the perimeter of the active wellfield throughout operations, including during the rinsing periods.

During the life of the facility, there will be periods of time when rinsing is ongoing in areas that are proximal to active copper recovery operations. In these instances, Florence Copper will continue to maintain hydraulic control at the perimeter of the active ISCR wellfield, including both the areas undergoing active copper recovery and rinsing.

Florence Copper will closely manage the buffer zones between rinsing areas and active copper recovery areas to ensure that both processes continue without mutual interference. This management strategy includes the use of one or more rows of resting wells, and/or injection of fresh water between the active copper recovery areas and the rinsing area. The resting wells will be those that are near the end of the active leaching cycle, that are periodically pumped to recover solution, and that are being prepared for inclusion in the next rinsing group. Injection of fresh water at the perimeter of active copper recovery operations and between those operations and rinsing areas will provide physical and hydraulic separation between these two processes. All of the wells actively undergoing active copper recovery, rinsing, and resting will be located within the hydraulic control perimeter.

Florence Copper has prepared a diagram (Figure A-18) illustrating the planned wellfield rinsing sequence. Figure A-18 is attached.

Request 3:

The USEPA requested that Florence Copper include tables equivalent to Tables P-3 and P-4 of the PTF UIC application into the UIC application for the commercial ISCR facility.

Response 3:

Tables P-3 and P-4 from the PTF UIC application were developed in support of the PTF APP application and were incorporated into the PTF UIC application. Equivalent Tables have been incorporated into the draft Aquifer Protection Permit (APP) No. P-101704 for commercial ISCR operations as Table 13 (Quarterly Groundwater Compliance Monitoring) and Table 14 (Annual Groundwater Monitoring).

Florence Copper hereby requests that Tables 13 and 14 from APP No. P-101704 be incorporated into the UIC Application materials. Tables 13 and 14 are included in Exhibit D-7, which is attached to this letter.

Request 4:

The USEPA requested that Florence Copper incorporate information equivalent to Exhibit P-1 of the PTF UIC application into the UIC application for the commercial ISCR facility.

Response 4:

Florence Copper has prepared Exhibit D-7 which includes the requested information and is attached to this letter.

Request 5:

The USEPA requested that Attachment 15 (Detailed Proposal Indicating Alert Levels, Discharge Limitations, Aquifer Quality Limits, Monitoring Requirements and Compliance Schedule Items [Item 19I]) of the APP application be incorporated into the UIC application for the commercial ISCR facility.

Response 5:

Attachment 15 of the application for significant amendment of APP No. P-101704 was prepared in May of 2019, and subsequently submitted to the Arizona Department of Environmental Quality (ADEQ) for review. During the course of review, certain elements proposed in Attachment 15 were accepted by ADEQ, and others were revised in discussion with ADEQ or adjusted by ADEQ to reflect current policy. Consequently, Attachment 15 does not fully reflect the current planned content of APP No. P-101704. The content of Attachment 15 has been superseded by the content placed in the Draft APP issued on August 6, 2020. The Draft APP (attached) includes the proposed and modified requirements for Alert Levels, APP Discharge Limitations, Aquifer Quality Limits, Monitoring Requirements and Compliance Schedule Items.

Florence Copper hereby requests that the USEPA incorporate these elements of the Draft APP into the UIC Application.

Please contact me at 520-316-3710 if you require any additional information.

Sincerely,
Florence Copper Inc.

Brent Berg
General Manager

cc: Maribeth Greenslade, Arizona Department of Environmental Quality

Enclosures

- Exhibit D-7: Discharge Limitations, Monitoring Requirements, and Alert Levels
- Figure A-18: Planned Rinsing Sequence
- Table 13: Quarterly Groundwater Compliance Monitoring
- Table 14: Annual Groundwater Monitoring
- Draft Permit

EXHIBIT D-7: DISCHARGE LIMITATIONS, MONITORING REQUIREMENTS, AND ALERT LEVELS

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1.1 Introduction

Florence Copper Inc. (Florence Copper) has prepared this document to provide information regarding proposed alert levels (AL), discharge limitations, monitoring requirements, compliance schedules, and temporary cessation or related plans. Accordingly, this document includes information that describes the ALs, discharge limitations, monitoring requirements, compliance schedules, and temporary cessation plans proposed by Florence Copper.

1.2 Discharge Limitations

Florence Copper proposes the following discharge limitations:

1. The permittee shall operate and maintain all permitted facilities to prevent unauthorized discharges pursuant to Arizona Revised Statutes § 49-201(12) resulting from failure or bypassing of Best Available Demonstrated Control Technology pollutant control technologies including liner failure, uncontrollable leakage, berm breaches that result in an unexpected loss of fluid, accidental spills, or other unauthorized discharges. Liner failure in a single-lined impoundment is any condition that would result in leakage exceeding 550 gallons per day per acre of the impoundment.
2. Injection of lixiviant will not be conducted until all core holes and wells within 500 feet of an injection or recovery well located in the In-Situ Copper Recovery wellfield have been abandoned in accordance with the Plugging and Abandonment Plan included as Attachment E of the Underground Injection Control (UIC) Permit application.
3. Florence Copper will initiate contingency actions identified in Aquifer Protection Permit (APP) No. P-101704 if process solution sampling data show that the polynuclear aromatic hydrocarbon concentration in the lixiviant exceeds 20 milligrams per liter (mg/L) in any monthly sample, or 10 mg/L as a quarterly average.

1.3 Monitoring Activities

This section describes monitoring activities that are designed to provide an early detection and prompt response to any condition that might result in an unauthorized discharge to an aquifer or to the vadose zone, or that might cause a violation of an Aquifer Water Quality Standard (AWQS) at a Point of Compliance (POC), or cause concentrations of discharge constituents to increase at a POC if the pre-operational concentrations of those constituents exceed AWQS. The activities include groundwater and facility/operational monitoring.

1.3.1 Monitoring and Analytical Requirements

All monitoring required under the UIC Permit will continue for the duration of the permit except as conducted in accordance with a temporary cessation plan approved by the U.S. Environmental Protection Agency (USEPA) and the Arizona Department of Environmental Quality (ADEQ). All sampling, preservation, and holding times will be in accordance with currently accepted standards of professional practice. Trip blanks, equipment blanks, and duplicate samples will also be obtained and chain-of-custody procedures will be followed, in accordance with currently accepted standards of professional practice. Florence Copper will consult with the USEPA Code of Federal Regulations for guidance in this regard. Copies of laboratory analyses and chain-of-custody forms will be maintained at the permitted facility. Upon request, these documents will be made immediately available for review by the USEPA and ADEQ personnel.

All samples collected for compliance monitoring at the POC wells will be analyzed using Arizona and USEPA approved methods. Regardless of the method used, the detection limits will be sufficient to determine compliance with the regulatory limits of the parameters specified in the UIC Permit. Analyses will be performed by a laboratory licensed by the Arizona Department of Health Services, Office of Laboratory Licensure and Certification. For results to be considered valid, all analytical work will meet quality control standards specified in the approved methods. A list of Arizona state-certified laboratories can be obtained at the address below:

Arizona Department of Health Services
Office of Laboratory Licensure and Certification
150 North 18 Avenue
Phoenix, AZ 85007
Phone: (602) 542-1025

Monitoring equipment required by this permit will be installed and maintained so that representative samples required by the permit can be collected. If new groundwater wells are determined to be necessary, the construction details will be submitted to the USEPA and ADEQ for approval prior to installation, and the APP and the UIC Permit shall be amended to include any new monitoring points.

1.3.2 Groundwater Monitoring Sampling Protocols

The following describes the protocols that will be used for the collection and analysis of groundwater samples collected from the designated POC wells listed in Tables 13 and 14 of APP No. P-101704. The protocols will be used for collecting and analyzing samples from POC wells for which ALs and Aquifer Quality Limits (AQL) have been established, and for collecting and analyzing groundwater samples for the purpose of developing groundwater quality data needed for the establishment of ALs and AQLs. ALs and/or AQLs have been previously established for all of the POC wells listed in Tables 13 and 14 of APP No. P-101704, except replacement well M33-UBF.

Static water levels will be measured and recorded prior to sampling. Wells will be purged of at least three borehole volumes (as calculated using the static water level) or until field parameters (pH, temperature, and conductivity) are stable, whichever represents the greater volume. If evacuation results in the well going dry, the well will be allowed to recover to 80 percent of the original borehole volume, or for 24 hours, whichever is shorter, prior to sampling. If after 24 hours there is not sufficient water for sampling, the well will be recorded as “dry” for the monitoring event. An explanation for reduced pumping volumes, a record of the volume pumped, and modified sampling procedures will be reported and submitted with the quarterly report.

Florence Copper may conduct the sampling using the low-flow purging method as described in the Arizona Department of Water Resources Research Center, March 1995 Field Manual for Water Quality Sampling. If the low flow sampling method is used, the well will be purged until indicator parameters stabilize. Indicator parameters will include dissolved oxygen, turbidity, pH, temperature, and conductivity.

1.3.3 Existing ALs and AQLs

Tables 13 and 14 of APP No. P-101704 list parameters that are to be monitored quarterly and semi-annually at each POC well during the period of the permit. ALs and/or AQLs have been previously established for all of the POC wells listed in Tables 13 and 14 of APP No. P-101704, except replacement well M33-UBF. Florence Copper will use the procedure set forth in APP No. P-101704 to calculate the ALs and/or AQLs for POC well M33-UBF.

The ALs and AQLs will be established and calculated using the method described below.

1.3.4 New ALs and AQLs

The ALs and AQLs will be established and calculated using the method set forth in APP No. P-101704 and described below.

1.3.4.1 New ALs

ALs shall be calculated for all contaminants with an established numeric AWQS for any new or replacement POC wells, unless otherwise specified in this permit.

The permittee shall submit the ambient groundwater data in tabulated form to the ADEQ for review. Copies of all laboratory analytical reports, field notes, and the Quality Assurance/Quality Control (QA/QC) procedures used in collection and analyses of the samples for all parameters listed in Table 13 of APP No. P-101704: *Quarterly Groundwater Compliance Monitoring* and Table 14 of APP No. P-101704: *Annual Groundwater Monitoring* to be established for each POC well, shall be submitted to the ADEQ. The permittee may submit a report with the calculations for each AL and AQL included in the permit for review and approval by the ADEQ, or the permittee may defer calculation of the ALs and AQLs by the ADEQ. The ALs shall be established and calculated following acceptable statistical guidance such as the *USEPA Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities Unified Guidance* (EPA 530-R-09-007).

The following criteria shall be met in establishing ALs in the permit:

1. The AL shall be calculated for a parameter using the analyses from a minimum of eight sampling events.
2. Any data where the laboratory Practical Quantitation Limit (PQL) exceeds 80 percent of the AWQS shall not be included in the AL calculation.
3. If a parameter is below the detection limit, the permittee must report the value as “less than” the numeric value for the PQL or detection limit for the parameter, not just as “non-detect.” For those parameters, the permittee shall use a value of one-half the reported detection limit for the AL calculation.
4. If the analytical results from more than 50 percent of the samples for a specific parameter are non-detect, then the AL shall be set at 80 percent of the AWQS.
5. If the calculated AL for a specific constituent and well is less than 80 percent of the AWQS, the AL shall be set at 80 percent of the AWQS for that constituent in that well.

1.3.4.2 New AQLs

For each of the monitored analytes for which a numeric AWQS has been adopted, the AQL shall be established as follows:

1. If the calculated AL is less than the AWQS, then the AQL shall be set equal to the AWQS.
2. If the calculated AL is greater than the AWQS, then the AQL shall be set equal to the calculated AL value, and no AL shall be set for that constituent at that monitoring point.

1.3.5 Replacement POC Wells

In the event that one or more of the designated POC wells should become unusable or inaccessible due to damage or any other event, a replacement well will be constructed and installed upon approval by the USEPA and ADEQ. If the replacement well is 50 feet or less from the original well, the ALs and/or AQLs calculated for the designated POC well will apply to the replacement well.

1.3.6 Compliance Monitoring

Florence Copper will begin compliance monitoring at the designated POC wells once applicable ALs and/or AQLs have been established. Florence Copper will continue to monitor each well listed in Tables 13 and 14 of APP No. P-101704 in accordance with the parameters and frequencies listed in those Tables. If monitoring indicates that an AL or AQL have been exceeded, Florence Copper will follow the requirements outlined in Section 2.6.2.5 of APP No. P-101704, and applicable sections of the UIC Permit. The results of compliance monitoring will be documented and submitted with the quarterly report to the USEPA and ADEQ.

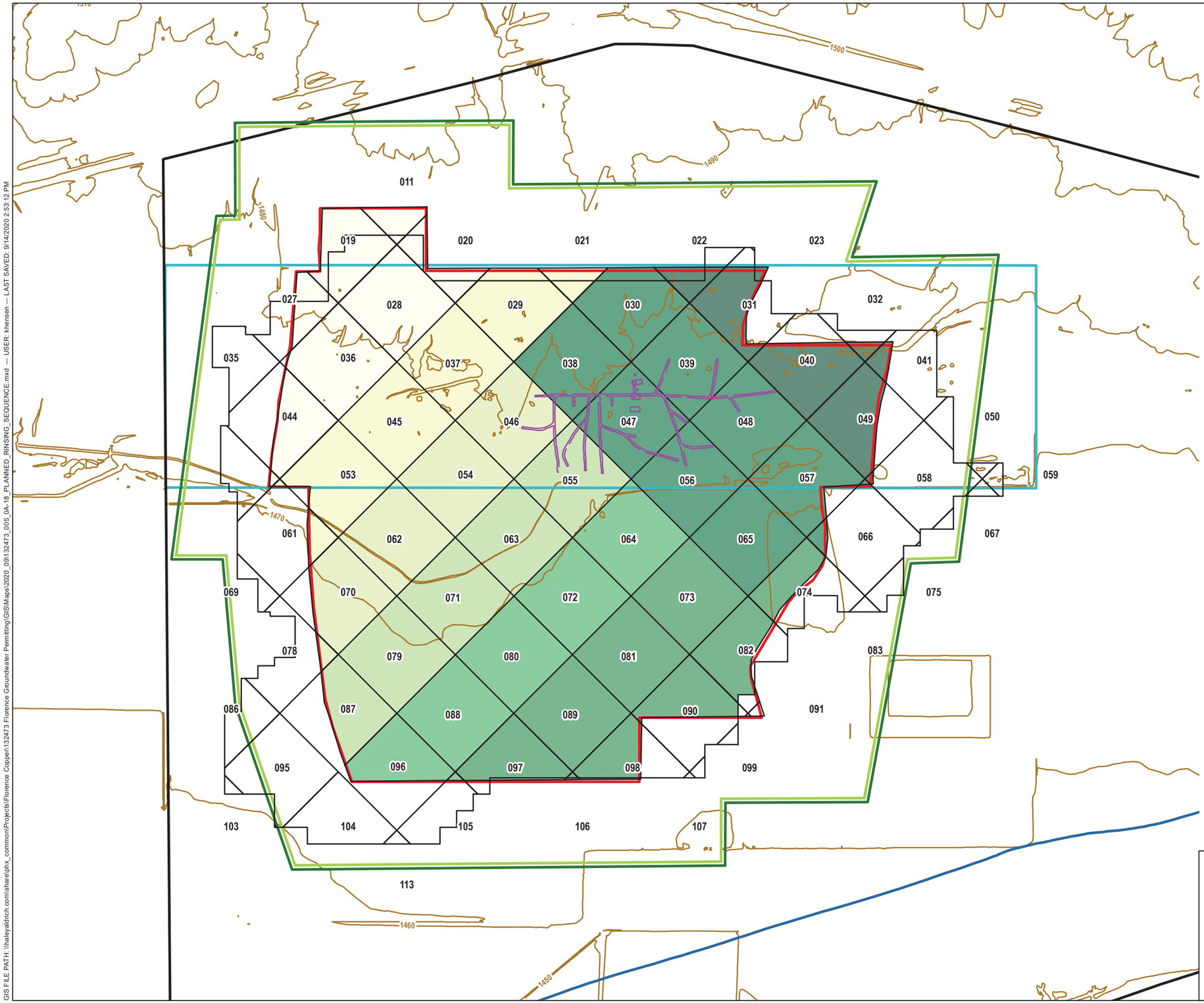
1.3.7 Facility/Operational Monitoring

1.3.7.1 Facility Monitoring

Exhibit D-2 of Attachment D (Operations Plan) of the UIC Application, lists facility components that will be monitored to maintain normal operations. Many of the components listed will be equipped with electronic monitors and automatic shutoffs. Conditions requiring initiation of the contingency plan are described in Exhibit D-2 of Attachment D of this Application.

1.4 Temporary Cessation

Florence Copper will give written notice to the USEPA and ADEQ before ceasing operation of the facility for a period of 60 days or greater. At the time of notification, Florence Copper will submit for USEPA and ADEQ approval a plan for maintenance of discharge control systems and for monitoring during the period of temporary cessation. Immediately following USEPA and ADEQ approval, Florence Copper will implement the approved plan. If necessary, the USEPA and ADEQ will amend APP and UIC Permit conditions to incorporate conditions to address temporary cessation. During the period of temporary cessation, Florence Copper will provide written notice to the USEPA and ADEQ of the operational status of the facility every 2 years. If Florence Copper intends to permanently cease operation of any facility, Florence Copper will submit written notification of closure to USEPA and ADEQ in accordance with permit conditions.



LEGEND

- 097 RESOURCE BLOCK NUMBER
- RESOURCE BLOCK
- UNDERGROUND WORKING
- 100 YEAR FLOOD PLAIN
- TOPOGRAPHIC CONTOUR (10-FT INTERVAL)
- ISCR WELL FIELD
- PROPOSED AOR / FORMER BHP AOR
- FLORENCE COPPER PROPERTY BOUNDARY
- STATE MINERAL LEASE BOUNDARY
- AQUIFER EXEMPTION BOUNDARY

RINSING AREAS A-H

- A
- B
- C
- D
- E
- F
- G
- H

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. TOPOGRAPHY DATA SOURCE: FLORENCE COPPER, OCTOBER 2010.

N

0 600 1,200
SCALE IN FEET

HALEY ALDRICH

FLORENCE COPPER, INC.
FLORENCE, ARIZONA

PLANNED RINSING SEQUENCE

SEPTEMBER 2020

FIGURE A-18

GIS FILE PATH: \\haleyaldrich.com\share\phx_common\Projects\Florence Copper\132473 Florence Groundwater Permitting\GIS\Maps\2020_09\132473_005_0A-18_PLANNED_RINSING_SEQUENCE.mxd — USER: khensen — LAST SAVED: 9/14/2020 2:53:12 PM

TABLE 13
QUARTERLY GROUNDWATER COMPLIANCE MONITORING
FLORENCE COPPER INC.
FLORENCE, ARIZONA

Parameter	M1-GL		M2-GU		M3-GL		M4-0		M6-GU		M7-GL		M8-O		M14-GL		M15-GU	
	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/Ll)	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)
Depth to Groundwater (ft. bgs)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Water Level Elevation (ft amsl)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Indicator Parameters[1]:																		
pH (field) (S.U.)	Monitor[2]	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Specific Conductance (field) (mhos/cm)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Temperature (field)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Fluoride	4.0	3.2	4.0	3.2	4.0	3.2	5.1	Monitor	4.0	3.2	4.0	3.2	4.0	3.6	4.0	3.2	4.0	3.2
Magnesium	NE[3]	31	NE	39	NE	36	NE	15	NE	44	NE	1.0	NE	1	NE	23	NE	21
Sulfate	NE	184.2	NE	275	NE	187	NE	405	NE	86	NE	82	NE	122	NE	144	NE	89
Total dissolved solids	NE	1028	NE	1496	NE	1157	NE	1072	NE	620	NE	464	NE	609	NE	874	NE	794

Notes:

[1] Metals must be analyzed as dissolved metals.

[2] Monitor = Monitoring required, but no aquifer quality limit (AQL) or alert level (AL) will be established in the permit.

[3] NE = Not Established

[4] Reserved - AQL/Als pending ambient monitoring being performed per Section 2.5.3.2 and the CSI requirements.

mhos/cm = millimhos per centimeter
amsl = above mean sea level
bgs = below ground surface
mg/L = milligrams per liter
S.U. = standard unit

TABLE 13
QUARTERLY GROUNDWATER COMPLIANCE MONITORING
FLORENCE COPPER INC.
FLORENCE, ARIZONA

Parameter	M16-GU(R)		M17-GL		M18-GU		M19-LBF		M20-O (R)		M21-UBF		M22-0		M23-UBF		M24-0	
	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)
Depth to Groundwater (ft. bgs)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Water Level Elevation (ft amsl)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Indicator Parameters[1]:																		
pH (field) (S.U.)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Specific Conductance (field) (mhos/cm)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Temperature (field)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Fluoride	4.0	3.2	4.0	3.2	4.0	3.2	4.0	3.2	4.0	3.2	4.0	3.2	4.0	3.2	4.0	3.2	4.0	3.2
Magnesium	NE	14	NE	9.3	NE	8.6	NE	21	NE	14	NE	87	NE	8.6	NE	69	NE	19
Sulfate	NE	112	NE	209	NE	86	NE	89	NE	112	NE	487	NE	86	NE	411	NE	1364
Total dissolved solids	NE	809	NE	831	NE	1094	NE	794	NE	809	NE	2867	NE	1094	NE	2392	NE	2363

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TABLE 13
QUARTERLY GROUNDWATER COMPLIANCE MONITORING
FLORENCE COPPER INC.
FLORENCE, ARIZONA

Parameter	M25-UBF		M26-0		M27-LBF		M28-LBF		M29-UBF		M30-0		M31-UBF		O19-GL		O49-GL(R)	
	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)
Depth to Groundwater (ft. bgs)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Water Level Elevation (ft amsl)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Indicator Parameters[1]:																		
pH (field) (S.U.)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Specific Conductance (field) (mhos/cm)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Temperature (field)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Fluoride	4.0	3.2	4.0	3.4	4.0	3.2	4.0	3.2	4.0	3.2	4.0	3.2	4.0	3.2	4.0	3.2	4.0	3.2
Magnesium	NE	76	NE	1.0	NE	51	NE	2.6	NE	84	NE	18	NE	NE	NE	17	NE	6.2
Sulfate	NE	387	NE	105	NE	179	NE	81	NE	456	NE	102	NE	330	NE	99	NE	181
Total dissolved solids	NE	2683	NE	556	NE	1745	NE	610	NE	2751	NE	824	NE	NE	NE	770	NE	801

Notes:

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mg/L = milligrams per liter
S.U. = standard unit

TABLE 13
QUARTERLY GROUNDWATER COMPLIANCE MONITORING
FLORENCE COPPER INC.
FLORENCE, ARIZONA

Parameter	P19-1-0		P49-O		M52-UBF (M32-UBF replacement)		M54-LBF		M54-O		M33-UBF (replacement)	
	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)
Depth to Groundwater (ft. bgs)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Water Level Elevation (ft amsl)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Indicator Parameters[1]:												
pH (field) (S.U.)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Specific Conductance (field) (mhos/cm)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Temperature (field)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Fluoride	4.0	3.2	4.0	3.2	4.0	3.2	4.0	3.2	4.0	3.2	Reserved[4]	Reserved
Magnesium	NE	23	NE	18	NE	45	NE	46.0	NE	11	Reserved	Reserved
Sulfate	NE	144	NE	181	NE	351	NE	329	NE	200	Reserved	Reserved
Total dissolved solids	NE	874	NE	849	NE	1666	NE	1731	NE	855	Reserved	Reserved

Notes:

[1] Metals must be analyzed as dissolved metals.

[2] Monitor = Monitoring required, but no aquifer quality limit (AQL) or alert level (AL) will be established in the permit.

[3] NE = Not Established

[4] Reserved - AQL/Als pending ambient monitoring being performed per Section 2.5.3.2 and the CSI requirements.

mhos/cm = millimhos per centimeter
amsl = above mean sea level
bgs = below ground surface
mg/L = milligrams per liter
S.U. = standard unit

TABLE 14
ANNUAL GROUNDWATER MONITORING
FLORENCE COPPER INC.
FLORENCE, ARIZONA

Parameter[1]	M1-GL		M2-GU		M3-GL		M4-O		M6-GU		M7-GL		M8-O		M14-GL		M15-GU	
	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)
pH (lab)	Monitor[2]	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Bicarbonate	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Calcium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Carbonate	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Chloride	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Nitrate as nitrogen[3]	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Potassium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Sodium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Cation/anion balance	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Aluminum	Monitor	0.71	Monitor	0.71	Monitor	0.71	Monitor	0.71	Monitor	0.71	Monitor	0.71	NE	0.71	NE	0.71	NE	0.71
Antimony	0.006	0.005	0.016	Monitor	0.006	0.005	0.006	0.005	0.006	0.005	0.006	0.005	0.006	0.005	0.016	NE	0.016	NE
Arsenic	0.05	0.026	0.05	0.026	0.05	0.026	0.05	0.026	0.05	0.026	0.05	0.026	0.05	0.026	0.05	0.026	0.05	0.026
Barium	2.0	1.6	2.0	1.6	2.0	1.6	2.0	1.6	2.0	1.6	2.0	1.6	2.0	1.6	2.0	1.6	2.0	1.6
Beryllium	0.004	0.0032	0.0053	Monitor	0.0053	Monitor	0.0053	NE	0.004	0.0032	0.004	0.0032	0.004	0.0032	0.004	0.0032	0.004	0.0032
Cadmium	0.005	Monitor	0.040	Monitor	0.005	Monitor	0.040	NE	0.005	0.004	0.040	NE	0.005	0.004	0.005	0.004	0.04	NE
Chromium (total)	0.10	0.08	0.10	0.08	0.10	0.08	0.10	0.08	0.10	0.08	0.10	0.08	0.10	0.08	0.10	0.08	0.10	0.08
Cobalt	NE[4]	0.005	NE	0.005	NE	0.005	NE	0.005	NE	0.005	NE	0.005	NE	0.005	NE	0.005	NE	0.005
Copper	NE	0.51	NE	0.51	NE	0.51	NE	0.51	NE	0.51	NE	0.51	NE	0.8	NE	0.8	NE	0.8
Iron	NE	2.2	NE	2.2	NE	2.2	NE	2.2	NE	2.2	NE	2.2	NE	2.2	NE	2.2	NE	2.2
Lead	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.026	0.05	0.026	0.05	0.026	0.05	0.04	0.05	0.04	0.05	0.04
Manganese	NE	0.22	NE	0.22	NE	0.22	NE	0.22	NE	0.22	NE	0.22	NE	0.22	NE	0.22	NE	0.22
Mercury	0.002	0.0016	0.002	0.0016	0.002	0.0016	0.002	0.0011	0.002	0.0011	0.002	0.0011	0.002	0.0016	0.002	0.0016	0.002	0.0016
Nickel	0.13	NE	0.13	NE	0.13	NE	0.10	0.08	0.10	0.08	0.13	NE	0.1	0.08	0.13	NE	0.13	NE
Selenium	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.027	0.05	0.027	0.05	0.027	0.05	0.04	0.05	0.04	0.05	0.04
Thallium	0.002	0.0016	0.002	0.0016	0.002	0.0016	0.002	0.0016	0.002	0.0016	0.002	0.0016	0.002	0.0016	0.002	0.0016	0.002	0.0016
Zinc	NE	2.5	NE	2.5	NE	2.5	NE	2.5	NE	2.5	NE	2.5	NE	4	NE	4	NE	4
Gross Alpha	NE	15	NE	15	NE	1	NE	15	NE	15	NE	15	NE	15	NE	15	NE	1
Adjusted Gross Alpha (pCi/L)[5]	15	12	15	12	15	12	15	12	15	12	15	12	15	12	15	12	15	12
Radium 226 + 228 (pCi/L)	5	4	5	4	5	4	5	Monitor	5	4	5	4	5	4	5	4	5	4
Total Uranium Isotopes (pCi/L)[6]	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Total Uranium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Total petroleum hydrocarbons- diesel	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Benzene	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004
Ethylbenzene	0.7	0.56	0.7	0.56	0.7	0.56	0.7	0.56	0.7	0.56	0.7	0.56	0.7	0.56	0.7	0.56	0.7	0.56
Toluene	1.0	0.8	1.0	0.8	1.0	0.8	1.0	0.8	1.0	0.8	1.0	0.8	1.0	0.8	1.0	0.8	1.0	0.8
Total Xylene	10	8	10	8	10	8	10	8	10	8	10	8	10	8	10	8	10	8

Notes:

[1] *Metals must be analyzed as dissolved metals.*

[2] *Monitor = Monitoring required, but no AQL or AL will be established in the permit.*

[3] *Nitrate will be used only for calculation of cation/anion balance because of regional nitrate pollution and none used in processes.*

[4] *NE = Not Established*

[5] *If the gross alpha particle activity is greater than the AL or AQL, then calculate the adjusted gross alpha particle activity. The adjusted gross alpha particle activity is the gross alpha particle activity, including radium 226, and any other alpha emitters, if present in the water sample, minus radon and total uranium (the sum of uranium 238, uranium 235 and uranium 234 isotopes). The gross alpha analytical procedure (evaporation technique: EPA Method 900.0) drives off radon gas in the water samples. Therefore, the Adjusted Gross Alpha should be calculated using the following formula: (Laboratory Reported Gross Alpha MINUS Sum of the Uranium Isotopes).*

[6] *Uranium Isotope activity results must be used for calculating Adjusted Gross Alpha.*

TABLE 14
ANNUAL GROUNDWATER MONITORING
FLORENCE COPPER INC.
FLORENCE, ARIZONA

Parameter[1]	M16-GU(R)		M17-GL		M18-GU		M19-LBF		M20-O(R)		M21-UBF		M22-O		M23-UBF		M24-O	
	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)
pH (lab)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Bicarbonate	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Calcium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Carbonate	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Chloride	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Nitrate as nitrogen[3]	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Potassium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Sodium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Cation/anion balance	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Aluminum	NE	0.71	NE	0.71	NE	0.71	NE	0.71	NE	0.71	NE	0.71	NE	0.71	NE	0.71	NE	0.71
Antimony	0.006	0.005	0.016	NE	0.016	NE	0.006	0.005	0.006	0.005	0.016	NE	0.016	NE	0.006	0.005	0.006	0.005
Arsenic	0.05	0.026	0.05	0.026	0.05	0.026	0.05	0.026	0.05	0.026	0.05	0.026	0.05	0.026	0.05	0.026	0.05	0.026
Barium	2.0	1.6	2.0	1.6	2.0	1.6	2.0	1.6	2.0	1.6	2.0	1.6	2.0	1.6	2.0	1.6	2.0	1.6
Beryllium	0.004	0.0032	0.004	0.0032	0.004	0.0032	0.004	0.0032	0.004	0.0032	0.004	0.0032	0.004	0.0032	0.004	0.0032	0.004	0.0032
Cadmium	0.04	NE	0.005	0.004	0.04	NE	0.005	0.004	0.04	NE	0.04	NE	0.04	NE	0.04	NE	0.005	0.004
Chromium (total)	0.10	0.08	0.10	0.08	0.10	0.08	0.10	0.08	0.10	0.08	0.10	0.08	0.10	0.08	0.10	0.08	0.10	0.08
Cobalt	NE	0.005	NE	0.005	NE	0.005	NE	0.005	NE	0.005	NE	0.005	NE	0.005	NE	0.005	NE	0.005
Copper	NE	0.8	NE	0.8	NE	0.8	NE	0.8	NE	0.8	NE	0.8	NE	0.8	NE	0.8	NE	0.8
Iron	NE	2.2	NE	2.2	NE	2.2	NE	2.2	NE	2.2	NE	2.2	NE	2.2	NE	2.2	NE	2.2
Lead	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.04
Manganese	NE	0.22	NE	0.22	NE	0.22	NE	0.22	NE	0.22	NE	0.22	NE	0.22	NE	0.22	NE	0.22
Mercury	0.002	0.0016	0.002	0.0016	0.002	0.0016	0.002	0.0016	0.002	0.0016	0.002	0.0016	0.002	0.0016	0.002	0.0016	0.002	0.0016
Nickel	0.1	0.08	0.1	0.08	0.1	0.08	0.1	0.08	0.1	0.08	0.1	0.08	0.1	0.08	0.1	0.08	0.1	0.08
Selenium	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.04
Thallium	0.002	0.0016	0.024	NE	0.002	0.0016	0.024	NE	0.024	NE	0.024	NE	0.024	NE	0.024	NE	0.002	0.0016
Zinc	NE	4	NE	4	NE	4	NE	4	NE	4	NE	4	NE	4	NE	4	NE	4
Gross Alpha	NE	15	NE	15	NE	15	NE	15	NE	15	NE	15	NE	15	NE	15	NE	15
Adjusted Gross Alpha (pCi/L)[5]	15	12	15	12	15	12	15	12	15	12	15	12	15	12	15	12	15	12
Radium 226 + 228 (pCi/L)	5	4	5	4	5	4	5	4	5	4	5	4	5	4	5	4	5	4
Total Uranium Isotopes (pCi/L)[6]	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Total Uranium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Total petroleum hydrocarbons- diesel	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Benzene	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004
Ethylbenzene	0.7	0.56	0.7	0.56	0.7	0.56	0.7	0.56	0.7	0.56	0.7	0.56	0.7	0.56	0.7	0.56	0.7	0.56
Toluene	1.0	0.8	1.0	0.8	1.0	0.8	1.0	0.8	1.0	0.8	1.0	0.8	1.0	0.8	1.0	0.8	1.0	0.8
Total Xylene	10	8	10	8	10	8	10	8	10	8	10	8	10	8	10	8	10	8

Notes:

[1] *Metals must be analyzed as dissolved metals.*

[2] *Monitor = Monitoring required, but no AQL or AL will be established in the permit.*

[3] *Nitrate will be used only for calculation of cation/anion balance because of regional nitrate pollution and none used in processes.*

[4] *NE = Not Established*

[5] *If the gross alpha particle activity is greater than the AL or AQL, then calculate the adjusted gross alpha particle activity. The adjusted gross alpha particle activity is the gross alpha particle activity, including radium 226, and any other alpha emitters, if present in the water sample, minus radon and total uranium (the sum of uranium 238, uranium 235 and uranium 234 isotopes). The gross alpha analytical procedure (evaporation technique: EPA Method 900.0) drives off radon gas in the water samples. Therefore, the Adjusted Gross Alpha should be calculated using the following formula: (Laboratory Reported Gross Alpha MINUS Sum of the Uranium Isotopes).*

[6] *Uranium Isotope activity results must be used for calculating Adjusted Gross Alpha.*

TABLE 14
ANNUAL GROUNDWATER MONITORING
FLORENCE COPPER INC.
FLORENCE, ARIZONA

Parameter[1]	M25-UBF		M26-O		M27-LBF		M28-LBF		M29-UBF		M30-O		M31-LBF		O19-GL		O49-GL(R)	
	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)
pH (lab)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Bicarbonate	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Calcium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Carbonate	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Chloride	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Nitrate as nitrogen[3]	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Potassium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Sodium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Cation/anion balance	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Aluminum	NE	0.71	NE	0.71	NE	0.71	NE	0.71	NE	0.71	NE	0.71	NE	0.71	NE	0.71	NE	0.71
Antimony	0.006	0.005	0.016	NE	0.006	0.005	0.006	0.005	0.006	0.005	0.006	0.005	0.006	0.005	0.006	0.005	0.006	0.005
Arsenic	0.05	0.026	0.05	0.026	0.05	0.026	0.05	0.026	0.05	0.026	0.05	0.026	0.05	0.026	0.05	0.026	0.05	0.026
Barium	2.0	1.6	2.0	1.6	2.0	1.6	2.0	1.6	2.0	1.6	2.0	1.6	2.0	1.6	2.0	1.6	2.0	1.6
Beryllium	0.004	0.0032	0.004	0.0032	0.004	0.0032	0.004	0.0032	0.004	0.0032	0.004	0.0032	0.004	0.0032	0.004	0.0032	0.004	0.0032
Cadmium	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004
Chromium (total)	0.10	0.08	0.10	0.08	0.10	0.08	0.10	0.08	0.10	0.08	0.10	0.08	0.10	0.08	0.10	0.08	0.10	0.08
Cobalt	NE	0.005	NE	0.005	NE	0.005	NE	0.005	NE	0.005	NE	0.005	NE	0.005	NE	0.005	NE	0.005
Copper	NE	0.8	NE	0.8	NE	0.8	NE	0.8	NE	0.8	NE	0.8	NE	0.8	NE	0.8	NE	0.8
Iron	NE	2.2	NE	2.2	NE	2.2	NE	2.2	NE	2.2	NE	2.2	NE	2.2	NE	2.2	NE	2.2
Lead	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.04
Manganese	NE	0.22	NE	0.22	NE	0.22	NE	0.22	NE	0.22	NE	0.22	NE	0.22	NE	0.22	NE	0.22
Mercury	0.002	0.0016	0.002	0.0016	0.002	0.0016	0.002	0.0016	0.002	0.0016	0.002	0.0016	0.002	0.0016	0.002	0.0016	0.002	0.0016
Nickel	0.1	0.08	0.1	0.08	0.1	0.08	0.1	0.08	0.1	0.08	0.1	0.08	0.1	0.08	0.13	NE	0.1	0.08
Selenium	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.04
Thallium	0.024	NE	0.002	0.0016	0.024	NE	0.024	NE	0.024	NE	0.024	NE	0.024	NE	0.024	NE	0.024	NE
Zinc	NE	4	NE	4	NE	4	NE	4	NE	4	NE	4	NE	4	NE	4	NE	4
Gross Alpha	NE	15	NE	15	NE	15	NE	15	NE	15	NE	15	NE	15	NE	15	NE	15
Adjusted Gross Alpha (pCi/L)[5]	15	12	15	12	15	12	15	12	15	12	15	12	15	12	15	12	15	12
Radium 226 + 228 (pCi/L)	5	4	5	4	5	4	5	4	5	4	5	4	5	4	5	4	5	4
Total Uranium Isotopes (pCi/L)[6]	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Total Uranium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Total petroleum hydrocarbons- diesel	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Benzene	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004
Ethylbenzene	0.7	0.56	0.7	0.56	0.7	0.56	0.7	0.56	0.7	0.56	0.7	0.56	0.7	0.56	0.7	0.56	0.7	0.56
Toluene	1.0	0.8	1.0	0.8	1.0	0.8	1.0	0.8	1.0	0.8	1.0	0.8	1.0	0.8	1.0	0.8	1.0	0.8
Total Xylene	10	8	10	8	10	8	10	8	10	8	10	8	10	8	10	8	10	8

Notes:

[1] Metals must be analyzed as dissolved metals.

[2] Monitor = Monitoring required, but no AQL or AL will be established in the permit.

[3] Nitrate will be used only for calculation of cation/anion balance because of regional nitrate pollution and none used in processes.

[4] NE = Not Established

[5] If the gross alpha particle activity is greater than the AL or AQL, then calculate the adjusted gross alpha particle activity. The adjusted gross alpha particle activity is the gross alpha particle activity, including radium 226, and any other alpha emitters, if present in the water sample, minus radon and total uranium (the sum of uranium 238, uranium 235 and uranium 234 isotopes). The gross alpha analytical procedure (evaporation technique: EPA Method 900.0) drives off radon gas in the water samples. Therefore, the Adjusted Gross Alpha should be calculated using the following formula: (Laboratory Reported Gross Alpha MINUS Sum of the Uranium Isotopes).

[6] Uranium Isotope activity results must be used for calculating Adjusted Gross Alpha.

TABLE 14
ANNUAL GROUNDWATER MONITORING
FLORENCE COPPER INC.
FLORENCE, ARIZONA

Parameter[1]	P19-1-O		P49-O		M52-UBF		M54-LBF		M54-O		M33-UBF (replacement)	
	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)
pH (lab)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Bicarbonate	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Calcium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Carbonate	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Chloride	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Nitrate as nitrogen[3]	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Potassium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Sodium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Cation/anion balance	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Aluminum	NE	0.71	NE	0.71	NE	0.16	NE	0.16	NE	0.16	Reserved	Reserved
Antimony	0.006	0.005	0.006	0.005	0.006	0.0048	0.006	0.0048	0.006	0.0048	Reserved	Reserved
Arsenic	0.05	0.026	0.05	0.026	0.05	0.026	0.05	0.026	0.05	0.026	Reserved	Reserved
Barium	2.0	1.6	2.0	1.6	2.0	1.6	2.0	1.6	2.0	1.6	Reserved	Reserved
Beryllium	0.0053	NE	0.0053	NE	0.004	0.0032	0.004	0.0032	0.004	0.0032	Reserved	Reserved
Cadmium	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004	Reserved	Reserved
Chromium (total)	0.10	0.08	0.10	0.08	0.10	0.08	0.10	0.08	0.10	0.08	Reserved	Reserved
Cobalt	NE	0.005	NE	0.005	NE	0.002	NE	0.002	NE	0.002	Reserved	Reserved
Copper	NE	0.8	NE	0.8	NE	0.8	NE	0.8	NE	0.8	Reserved	Reserved
Iron	NE	2.2	NE	2.2	NE	1.4	NE	1.4	NE	1.4	Reserved	Reserved
Lead	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.04	Reserved	Reserved
Manganese	NE	0.22	NE	0.22	NE	0.52	NE	0.52	NE	0.22	Reserved	Reserved
Mercury	0.002	0.0016	0.002	0.0016	0.002	0.0016	0.002	0.0016	0.002	0.0016	Reserved	Reserved
Nickel	0.13	NE	0.1	0.08	0.1	0.08	0.1	0.08	0.1	0.08	Reserved	Reserved
Selenium	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.04	Reserved	Reserved
Thallium	0.024	NE	0.002	0.0016	0.002	0.0016	0.002	0.0016	0.002	0.0016	Reserved	Reserved
Zinc	NE	4	NE	4	NE	4	NE	4	NE	4	Reserved	Reserved
Gross Alpha	NE	15	NE	15	NE	15	NE	15	NE	15	Reserved	Reserved
Adjusted Gross Alpha (pCi/L)[5]	15	12	15	12	15	12	26.5	NE	26.5	NE	Reserved	Reserved
Radium 226 + 228 (pCi/L)	5	4	5	4	17.2	NE	17.2	NE	17.2	NE	Reserved	Reserved
Total Uranium Isotopes (pCi/L)[6]	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Total Uranium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Total petroleum hydrocarbons- diesel	Monitor	Monitor	Monitor	Monitor	Monitor	NE	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Benzene	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004
Ethylbenzene	0.7	0.56	0.7	0.56	0.7	0.56	0.7	0.56	0.7	0.56	0.7	0.56
Toluene	1.0	0.8	1.0	0.8	1.0	0.8	1.0	0.8	1.0	0.8	1.0	0.8
Total Xylene	10	8	10	8	10	8	10	8	10	8	10	8

Notes:

[1] Metals must be analyzed as dissolved metals.

[2] Monitor = Monitoring required, but no AQL or AL will be established in the permit.

[3] Nitrate will be used only for calculation of cation/anion balance because of regional nitrate pollution and none used in processes.

[4] NE = Not Established

[5] If the gross alpha particle activity is greater than the AL or AQL, then calculate the adjusted gross alpha particle activity. The adjusted gross alpha particle activity is the gross alpha particle activity, including radium 226, and any other alpha emitters, if present in the water sample, minus radon and total uranium (the sum of uranium 238, uranium 235 and uranium 234 isotopes). The gross alpha analytical procedure (evaporation technique: EPA Method 900.0) drives off radon gas in the water samples. Therefore, the Adjusted Gross Alpha should be calculated using the following formula: (Laboratory Reported Gross Alpha MINUS Sum of the Uranium Isotopes).

[6] Uranium Isotope activity results must be used for calculating Adjusted Gross Alpha.

AQUIFER PROTECTION PERMIT NO. P-101704
PLACE ID 1579, LTF 78620
SIGNIFICANT AMENDMENT

1.0 AUTHORIZATION

In compliance with the provisions of Arizona Revised Statutes (A.R.S.) Title 49, Chapter 2, Articles 1, 2 and 3, Arizona Administrative Code (A.A.C.) Title 18, Chapter 9, Articles 1 and 2, A. A. C. Title 18, Chapter 11, Article 4 and amendments thereto, and the conditions set forth in this permit, the Arizona Department of Environmental Quality (ADEQ) hereby authorizes Florence Copper Inc. to operate the Florence Copper Project located in Florence, Arizona, Pinal County, in the Pinal Active Management Area, in Sections 26, 27, 28, 33, 34, and 35, Range 9E, Township 4S of the Gila and Salt River Base Line and Meridian.

This permit becomes effective on the date of the Water Quality Division Director's signature and shall be valid for the life of the facility (operational, closure, and post-closure periods), unless suspended or revoked pursuant to A.A.C. R18-9-A213. The permittee shall construct, operate and maintain the permitted facilities:

1. Following all the conditions of this permit including the design and operational information documented or referenced below, and
2. Such that Aquifer Water Quality Standards (AWQS) are not violated at the applicable point(s) of compliance (POC) set forth below or if an AWQS for a pollutant has been exceeded in an aquifer at the time of permit issuance, that no additional degradation of the aquifer relative to that pollutant and as determined at the applicable POC occurs as a result of the discharge from the facility.

1.1. PERMITTEE INFORMATION

Facility Name:	Florence Copper Project
Facility Address:	1575 W. Hunt Highway Florence, Arizona 85132
County:	
Annual Registration Fee Flow Rate:	Greater than 10,000,000 gallons per day (gpd)
Permittee:	Florence Copper Inc.
Permittee Address:	1575 W. Hunt Highway Florence, Arizona 85132
Facility Contact:	Brent Berg, General Manager
Emergency Phone No.:	520 374-3984
Latitude/Longitude:	33º 03' 00" N / 111º 25' 00" W
Legal Description:	Township 4S, Range 9E, Sections 26, 27, 28, 33, 34, and 35 NE¼, NE¼, SE¼ of the Gila and Salt River Base Line and Meridian

1.2. AUTHORIZING SIGNATURE

_____

Trevor Baggiore, Director
Water Quality Division
Arizona Department of Environmental Quality
Signed this _____ day of _____, 20_____

THIS AMENDED PERMIT SUPERCEDES ALL PREVIOUS PERMITS

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2.0 SPECIFIC CONDITIONS

[A.R.S. §§ 49-203(4), 49-241(A)]

2.1. FACILITY / SITE DESCRIPTION

[A.R.S. § 49-243(K)(8)]

The permittee is authorized to conduct In-Situ Copper Recovery (ISCR) using up to a total of 1,765 injection and recovery wells, 90 perimeter wells and approximately 45 observation wells within the area listed in permit Section 1.1. The number of injection, recovery and perimeter wells open at any time shall be limited to 462, including active wells that have been used for injection and recovery and wells that are being rinsed prior to well abandonment. The ISCR Area covers an area of approximately 212 acres and is divided into resource blocks for planning purposes. Each resource block measures 500 feet by 500 feet and will include approximately 61 injection and recovery wells. The well installation and operation will progress following a planned sequence with the number of wells and resource blocks dependent on the capacity of the solvent extraction electrowinning (SX/EW) plant. The well and resource block sequence will proceed on a contiguous basis to maintain efficiencies derived from consolidated hydraulic control and centralized injection and recovery infrastructure.

The ISCR process involves injecting a lixiviant (99.5% water mixed with 0.5% sulfuric acid) through injection wells into the oxide zone of the bedrock beneath the site for the purposes of dissolving copper minerals from the ore body. The injection zone is between approximately 500 feet below ground surface (ft bgs) to 1,185 ft bgs. The resulting copper-bearing solution will be pumped by recovery wells to the surface where copper will be removed from the solution in the SX/EW plant. The barren solution from the SX/EW plant will be re-acidified and re-injected back into the oxide zone. Excess barren solution will be sent to the Process Water Impoundment pond to evaporate. Evaporation may be enhanced through the use of mechanical evaporators.

The anticipated duration of injection and recovery operation for each well is approximately 4 years. Each well will be taken out of injection/recovery service once the economically producible copper has been recovered. Injection and recovery wells that have been taken out of service will be used to rinse the formation while injection and recovery operations continue in other areas of the ISCR Area. Rinsing will be conducted in the same sequence in which the wells are taken out of service and will generally commence within 6 months of a well being taken out of service, subject the availability of a sufficient number of wells to effectively rinse the mined area.

During rinsing, rinse solution is injected into the injection zone and recovered to return the injection zone to pre-leaching water quality conditions. Rinsing is estimated to begin in year 5 of ISCR operations on the first injection and recovery wells, and is anticipated to continue at each well for a period of 2 years, during which time, approximately 6 to 9 pore volumes of water will have been flushed through the bedrock formation. Rinsing will continue 2 years beyond the end of copper extraction operations. Once rinsing has been completed, each of the wells will be plugged and abandoned, except for selected wells that will remain open for post-closure monitoring.

The discharging facilities from the Florence Copper Production Test Facility (PTF) Temporary Individual APP (Inventory No. 106360), are incorporated into this permit as required by that permit's compliance schedule. Prior to operation of the first resource block within the ISCR Area, a rinsing demonstration report for the PTF well field will be submitted to ADEQ for approval as part of an amendment application to approve operation of the ISCR resource block.

The site includes the following permitted discharging facilities:

Table 1: DISCHARGING FACILITIES		
Facility	**Latitude**	**Longitude**
Production Test Facility (PTF) Well Field (see Table 16: PTF INJECTION AND RECOVERY WELLS)	33° 3’ 1.39” N	111° 26’ 4.69” W
PTF Process Water Impoundment	33° 3’ 8.67” N	111° 25’ 22.18” W
PTF Runoff Pond	33° 3’ 4.89” N	111° 25’ 22.6” W
BHP Copper Well Field	33° 02’ 56” N	111° 25’ 52” W
BHP Copper Evaporation Pond	33° 02’ 45’’ N	111° 25’ 27’’ W
In-Situ Copper Recovery (ISCR) Area (see Table 18: RESOURCE BLOCK WELLS)	33° 02’ 56” N	111° 25’ 52” W
PLS Pond	33° 03’ 04” N	111° 24’ 60” W
Raffinate Pond	33° 03’ 04” N	111° 24’ 55” W
Runoff Pond	33° 03’ 04” N	111° 24’ 50” W
Water Impoundment 1	To be determined	To be determined
Water Impoundment 2	To be determined	To be determined
Water Impoundment 3	To be determined	To be determined
Water Impoundment 4	To be determined	To be determined
Water Impoundment 5	To be determined	To be determined

2.1.1. Annual Registration Fee

[A.R.S. § 49-242 and A.A.C. R18-14-104]

The annual registration fee for this permit is payable to ADEQ each year. The annual registration fee flow rate is established in permit Section 1.1. If the facility is not yet constructed or is incapable of discharge at this time, the permittee may be eligible for reduced fees under the A.A.C. R18-14-104. Send all correspondence requesting reduced fees to the Water Quality Division of ADEQ. Please reference the permit number, LTF number and why reduced fees are requested under the rule.

2.1.2. Financial Capability

[A.R.S. § 49-243(N) and A.A.C. R18-9-A203]

The permittee has demonstrated financial capability under A.R.S. § 49-243(N) and A.A.C. R18-9-A203. The permittee shall maintain financial capability throughout the life of the facility. The estimated closure and post-closure cost is $34,468,500. The cost estimate is based on the list of discharging facilities in Section 2.1, with a maximum of 462 ISCR wells in operation at any time and five water impoundments (BHP Copper Evaporation Pond and 4 new Water Impoundments) at any time. If the number of wells or water impoundments exceed these numbers, the cost estimate and financial capability demonstration shall be updated. The financial assurance mechanism was demonstrated through a performance surety bond held by ADEQ in the amount of $4,696,000 (A.A.C. R18-9-A203 (C)(2)), and through a financial mechanism to be payable to the U.S. Environmental Protection Agency (EPA) Underground Injection Control (UIC) program in the amount of $29,772,500 (A.A.C. R18-9-A203(G)). The UIC financial mechanism shall be in place prior to discharge under this permit, in accordance with timeframes specified in the Compliance Schedule of this permit, Section 3.

2.2. BEST AVAILABLE DEMONSTRATED CONTROL TECHNOLOGY (BADCT)

[A.R.S. § 49-243(B)(1) and A.A.C. R18-9-A202(A)(5)]

All of the discharging facilities listed in Table 1: DISCHARGING FACILITIES employ BADCT requirements as set forth in A.R.S. §49-243(B)(1) and A.A.C. R18-9-A202(A)(5). All discharging facilities listed in Table 1 shall be designed, constructed, operated, and maintained in accordance with BADCT requirements, as outlined in Section 4.2, Table 6: PERMITTED FACILITIES AND BADCT and in the pre-operational and operational requirements in Sections 2.2.3 and 2.2.4.

2.2.1. Engineering Design

BADCT description for the permitted facilities is presented in Section 4.2, Table 6: PERMITTED FACILITIES AND BADCT.

2.2.2. Site-Specific Characteristics

Not applicable.

2.2.3. Pre-Operational Requirements for Each Resource Block

1. All boreholes or wells, other than those approved for the ISCR area, located within 500-feet of the ISCR well field boundary shall be plugged and abandoned in compliance with Arizona Department of Water Resources (ADWR) rules and EPA Underground Injection Control (UIC) regulations prior to ISCR operation. All boreholes or wells within a 150-foot radius of all ponds and impoundments shall also be plugged and abandoned in compliance with Arizona ADWR rules. Documentation records for the plugging and abandonment of all boreholes and wells within 500 feet of the ISCR area and within 150 feet of the ponds and impoundments shall be submitted in accordance with the Reporting Requirements in Section 2.7.
2. All Class III injection wells shall be drilled, cased and cemented according to the requirements of the UIC permit. Prior to commencement of operation, all new Class III injection wells shall meet the mechanical integrity testing (MIT) requirements of the UIC permit.
3. The permittee shall complete an aquifer pump test for each resource block prior to injection in order to optimize knowledge of subsurface characteristics particularly within the targeted in-situ leaching zone., Inward hydraulic gradient towards the recovery/perimeter wells shall be established and confirmed prior to the injection of acidified process solution into the injection wells. Results shall be reported in accordance with the Reporting Requirements in Section 2.7.
4. The permittee shall propose well bore electrical conductivity alert levels for each resource block based on baseline electrical conductivity measurements from the annular conductivity devices within the resource block, adjacent resource blocks if applicable, and report results in accordance with the Reporting Requirements in Section 2.7.
5. The permittee shall establish ambient groundwater concentrations for parameters listed in Table 12: PARAMETERS FOR AMBIENT GROUNDWATER MONITORING for each resource block using an ADEQ approved statistical method (see Section 2.5.3.3) to determine pre-mining concentrations at the ISCR wells and report results in accordance with the Reporting Requirements in Section 2.7. At least 5 wells per resource block, or in the case of a small resource block at least 1 well per 12 installed wells, will be used to establish ambient groundwater concentrations.

2.2.4. Operational Requirements and BADCT Monitoring

1. The discharging facilities shall be operated according to and inspected for compliance with the requirements in Section 4.2, Table 10: REQUIRED INSPECTIONS AND OPERATIONAL MONITORING, and recorded in a log as required by Section 2.7.2. If damage is identified during an inspection that could cause or contribute to a discharge, proper repairs shall be promptly performed in accordance with Section 2.6 of this permit and recorded in a log.
2. The injection wells at the site are classified as Class III Injection wells by the USEPA and are permitted by EPA's UIC Program. The injection and recovery wells shall be designed to meet the mechanical integrity requirements in the UIC regulations, Code of Federal Regulations (CFR) part 144 and 146. All injection wells and recovery wells shall be designed and installed to prevent injection into the top 40 feet (the exclusion zone) of the Oxide zone.
3. The injection of the solutions shall be limited to the Oxide ore body only. Fresh water may be injected into the ore body to assess and maintain the hydraulics of the injection and recovery patterns, assessing the performance of surface related facilities and rinsing operation.
4. The ISCR operation relies on hydraulic control of the solutions to demonstrate BADCT. An inward hydraulic gradient shall be measured by water level elevations in recovery/perimeter, observation and POC wells as required by Section 4.2, Table 15: IN-SITU BADCT MONITORING.
5. Fluid electrical conductivity shall be measured at observation and injection wells to confirm hydraulic control as required by Section 4.2, Table 15: IN-SITU BADCT MONITORING.
6. Well bore electrical conductivity shall be measured at annular conductivity devices (ACDs) above the middle fine grained unit (MFGU) on all injection, recovery, observation and perimeter wells as required by Section 4.2, Table 15: IN-SITU BADCT MONITORING.
7. Groundwater elevations in wells completed in the Oxide ore body shall be measured to confirm the groundwater elevation at the downgradient edge of the active ISCR well field (any well blocks in production or rinsing prior to well abandonment) is lower than the edge of the downgradient pollutant management area boundary (PMA) to confirm the BADCT cone of depression as required by Section 4.2, Table 15: IN-SITU BADCT MONITORING.
8. The rates of injection and recovery shall be continuously monitored and controlled so that the total volume of solution recovered is 106% or greater than the volume of solution injected, averaged over a 24 hour period as required by Section 4.2, Table 15: IN-SITU BADCT MONITORING. The permittee may request a permit amendment to decrease the minimum ratio of extraction to injection rate permitted. Any request for a decrease in the minimum ratio shall demonstrate to the satisfaction of ADEQ that the reduction in the minimum percent extraction to injection rate will not interfere with the permitted operation of the facility or its ability to meet the conditions described in this permit.
9. Automatic controls and alarms shall be used in the well field to ensure process upsets do not result in the loss of hydraulic control. Hydraulic control over the injected solutions shall be maintained from the time injection begins and until well abandonment is completed by the permittee and approved by the appropriate regulatory agencies and groundwater in the resource blocks meets Section 2.9 closure criteria.
10. The injection pressure in the Class III injection wells shall be kept below the fracture pressure of the oxide ore body and will be measured at each injection well as required by Section 4.2, Table 15: IN-SITU BADCT MONITORING. A fracture gradient of 0.65 pounds per square inch per foot (psi/ft) of depth was established by field test data as being adequate to prevent hydraulic fracturing of the bedrock. The permittee may request a permit amendment to increase the injection pressure limitations based on a valid step-rate injection test in the proposed injection zone(s). Step-rate testing shall be performed in accordance with the EPA Region 9 Step-Rate Test Policy.

11. Observation wells may be temporarily converted to use as recovery wells in order to maintain hydraulic control.

2.2.5. PTF Well Field Rinsing Demonstration Requirements

1. Rinsing shall consist of injecting formation water and neutralization agents. At all times during initial rinsing, the permittee will maintain hydraulic control by sustaining an inward hydraulic gradient within the well field. The permittee will monitor the rinsing progress by analyzing the water recovered from well-field headers for sulfate concentration. When levels of sulfate in the headers have reached approximately 750 parts per million (ppm), the permittee will sample the well header discharges for constituents listed in Section 4.2 Table 14: ANNUAL GROUNDWATER MONITORING. If the results of the sampling show concentrations of parameters greater than the AWQS and or greater than the pre-determined well field concentrations, then rinsing operations will continue until all compounds are below AWQSs or predetermined well field concentrations.
2. The permittee will sample all of the wells in the well field to determine if the sulfate concentrations are less than 750 ppm and the pH is above 5.0 S.U. The permittee will continue rinsing each well until such time that the sulfate concentration in all wells is less than 750 ppm and the pH is above 5.0 S.U.
3. When all individual well sulfate concentrations in the well field are less than 750 ppm and the pH is above 5.0 S.U., hydraulic control will be discontinued and the well field allowed to rest for 30 days. At the end of the 30-day rest period, the wells will be re-sampled and if sulfate concentrations remain below 750 ppm and pH remains above 5.0 S.U. and Table 14: ANNUAL GROUNDWATER MONITORING parameters remain below AQLs, the permittee may cease rinsing within the well field. If any samples exceed rinse verification standards, the rinsing sequence shall be continued and additional water quality samples shall be collected until standards are met.
4. The results of the PTF well field rinsing demonstration shall be provided in a report to ADEQ as required by Section 2.7.4.5 and the Compliance Schedule of this permit, Section 3.0.

2.3. DISCHARGE LIMITATIONS

[A.R.S. §§ 49-201(14), 49-243 and A.A.C. R18-9-A205(B)]

The permittee shall operate and maintain all permitted facilities to prevent unauthorized discharges pursuant to A.R.S. §§ 49-201(12) resulting from failure or bypassing of BADCT pollutant control technologies including liner failure, uncontrollable leakage, berm breaches that result in an unexpected loss of fluid, accidental spills, or other unauthorized discharges. Liner failure in a single-lined impoundment is any condition that would result in leakage exceeding 550 gallons per day per acre of the impoundment.

2.3.1. PTF Injection and Recovery Well Field

Hydraulic control over the injected solutions shall be maintained during the operating life of the facility. In-situ solutions shall be injected within the Oxide unit.

2.3.2. PTF Process Water Impoundment

The Process Water Impoundment (PWI) shall be used to store neutralized solutions and resulting sediments, lime and flocculent/coagulant for settling, direct precipitation, and local area run-off from the wellfield. Mechanical evaporators may be used for enhanced evaporation.

2.3.3. PTF Run-off Pond

The PTF Runoff Pond shall be used to store storm water runoff from roofs on-site structures, cathode storage slab, and concrete apron on the south side of the PTF SX/EW building; fire sprinkler water or process solutions that may enter or overflow the PTF SX/EW Building floor sump; any spills or wash down from these areas; trace amounts of SX/EW reagents; and process upset events.

2.3.4. BHP Copper Well Field

The wells shall not be used for injection or recovery of process solutions.

2.3.5. BHP Copper Evaporation Pond

The pond shall be used to store and evaporate neutralized solutions and resulting sediments. Neutralized solutions include hydraulic control solution, raffinate bleed, lime and flocculent/coagulant for settling, direct precipitation and local area runoff from the wellfield. Mechanical evaporators may be used for enhanced evaporation.

2.3.6. ISCR Area

Hydraulic control over the injected solutions shall be maintained during the operating life of the facility. Solutions shall be injected within the Oxide Unit.

2.3.7. PLS Pond

The PLS Pond may receive PLS solution, a small bleed stream of electrolyte, hydraulic control solution, reverse osmosis brine, direct precipitation and local area runoff from the wellfield.

2.3.8. Raffinate Pond

The Raffinate Pond may receive raffinate solution from the SX/EW plant, sulfuric acid from tank storage, fresh water make-up water, hydraulic control solution, trace amounts of SX/EW reagents, direct precipitation, and local area run off from the wellfield. The Raffinate Pond may also receive some discharge from the acid unloading/storage area.

2.3.9. Run-off Pond

The Runoff Pond shall be used to capture direct precipitation; storm water runoff from roofs on-site structures, cathode storage slab, and concrete apron on the south side of the SX/EW building; fire sprinkler water or process solutions that may enter or overflow the SX/EW Building floor sump; any spills or wash down from these areas; and process upset events.

2.3.10. Water Impoundments 1 through 5

The impoundments shall be used to store and evaporate neutralized solutions and resulting sediments. Neutralized solutions include hydraulic control solution, raffinate bleed and ISCR rinse water. Prior to discharge to the 5th impoundment, the closure cost estimate and financial assurance mechanism shall be updated to account for closure costs for the 5th impoundment

2.4. POINT OF COMPLIANCE (POC)

[A.R.S. § 49-244]

The Points of Compliance (POCs) have been established at the following locations:

Table 2: POINT(S) OF COMPLIANCE			
Monitoring Well Identification	**ADWR Registration Number**	**Latitude (North)**	**Longitude (West)**
M1-GL	55-547617	33° 02' 37"	111° 25' 55" W
M2-GU	55-547814	33° 02' 37"	111° 25' 18" W
M3-GL	55-547614	33° 02' 36"	111° 25' 18" W
M4-O	55-547614	33° 02' 37"	111° 25' 18" W
M6-GU	55-547815	33° 03' 15"	111° 26' 10" W
M7-GL	55-547611	33° 03' 15"	111° 26' 10" W
M8-O	55-547612	33° 03' 15"	111° 26' 10" W
M14-GL	55-549172	33° 03' 04"	111° 26' 13" W
M15-GU	55-547813	33° 03' 04"	111° 26' 14" W
M16-GU(R)	55-226469	33° 02' 50"	111° 26' 15" W
M17-GL	55-556094	33° 02' 50"	111° 26' 13" W
M18-GU	55-547809	33° 02’ 38"	111° 25' 55" W
M19-LBF	55-555828	33° 03' 13"	111° 25' 50" W
M20-O(R)	55-226473	33° 03' 13"	111° 25' 53" W
M21-UBF	55-555823	33° 03' 12"	111° 25' 50" W
M22-O	55-555831	33° 03' 04"	111° 26' 13" W
M23-UBF	55-555824	33° 03' 04"	111° 26' 14" W
M24-O	55-555832	33° 02' 54"	111° 26' 12" W
M25-UBF	55-555825	33° 02' 54"	111° 26' 13" W
M26-O	55-555833	33° 03' 17"	111° 26' 03" W
M27-LBF	55-555827	33° 03' 17"	111° 26' 04" W
M28-LBF	55-555834	33° 03' 17"	111° 26' 04" W
M29-UBF	55-555830	33° 03' 17"	111° 26' 03" W
M30-O	55-555826	33° 03' 13"	111° 25' 38" W
M31-LBF	55-556090	33° 03' 13"	111° 25' 38" W
M33-UBF (replacement)	TBD	TBD	TBD
P19-1-O	55-549151	33° 03' 13" N	111° 25' 56" W
O19-GL	55-549150	33° 03' 13" N	111° 25' 58" W
P49-O	55-549181	33° 02' 42" N	111° 26' 06" W
O49-GL(R)	55-222815	33° 02' 42" N	111° 26' 07" W
M52-UBF (M32-UBF-replacement)	55-226788	33° 03' 10" N	111° 25' 24" W

Monitoring requirements for each POC are listed in Section 4.1,Table 13: QUARTERLY GROUNDWATER COMPLIANCE MONITORING and Table 14: ANNUAL GROUNDWATER MONITORING. The Director may amend this permit to designate additional points of compliance if information on groundwater gradients or groundwater usage indicates the need.

2.5. MONITORING REQUIREMENTS

[A.R.S. § 49-243(K)(1), A.A.C. R18-9-A206(A)]

Unless otherwise specified in this permit, all monitoring required in this permit shall continue for the duration of the permit, regardless of the status of the facility. Monitoring shall commence the first full monitoring period following permit issuance. All sampling, preservation and holding times shall be in accordance with currently accepted standards of professional practice. Trip blanks, equipment blanks and duplicate samples shall also be obtained, and Chain-of-Custody procedures shall be followed, in accordance with currently accepted standards of professional practice. Copies of laboratory analyses and Chain-of-Custody forms shall be maintained at the permitted facility. Upon request, these documents shall be made immediately available for review by ADEQ personnel.

2.5.1. Discharge Monitoring

Discharge monitoring shall be conducted and reported on a one time basis at the PLS Pond, Raffinate Pond, Runoff Pond, BHP Copper Evaporation Pond and each Water Impoundment in accordance with Section 4.2 Table 7: ONE-TIME SAMPLING EVENT - DISCHARGE MONITORING LOCATIONS and for parameters listed in Table 9: DISCHARGE MONITORING SAMPLING PARAMETERS, and the Compliance Schedule in Section 3.0 in order to allow for accurate representation of process solutions. Discharge monitoring of the underground workings shall be conducted at the location identified in Section 4.2,Table 8Table 8: MULTIPLE SAMPLING EVENT - DISCHARGE MONITORING LOCATION for parameters listed in Table 9: DISCHARGE MONITORING SAMPLING PARAMETERS and in accordance with Section 2.7.4.3, ISCR Resource Block Pre-Operational Report and the Compliance Schedule, Section 3.0. Depth specific samples shall be obtained from the underground workings one month after the mining has ceased, one month after the rinsing phase, and into the closure and post-closure monitoring period.

2.5.2. Facility / Operational Monitoring

Permitted facilities shall be inspected for the performance levels listed in Section 4.2, Table 10: REQUIRED INSPECTIONS AND OPERATIONAL MONITORING. If damage is identified during an inspection that could cause or contribute to an unauthorized discharge pursuant to A.R.S. § 49-201(12), proper repairs shall be promptly performed by the permittee. Results of these inspections and monitoring activities shall be documented and maintained at the facility for at least 10 years, and as required by Section 2.7.2 of this permit.

2.5.3. Groundwater Monitoring and Sampling Protocols

Compliance groundwater monitoring is required under the terms of this permit. For all sampling methods, static water levels shall be measured and recorded prior to sampling.

Wells shall be purged of at least three borehole volumes (as calculated using the static water level) or until field parameters (pH, temperature, and conductivity) are stable, whichever represents the greater volume. If evacuation results in the well going dry, the well shall be allowed to recover to 80 percent of the original borehole volume, or for 24 hours, whichever is shorter, prior to sampling. If after 24 hours there is not sufficient water for sampling, the well shall be recorded as “dry” for the monitoring event.

As an alternative method for sampling, the permittee may conduct the sampling using the low-flow purging method as described in the Arizona Water Resources Research Center, March 1995 *Field Manual for Water Quality Sampling*. The well must be purged until indicator parameters stabilize. Indicator parameters shall include dissolved oxygen, turbidity, pH, temperature, and conductivity.

As a third alternative method for sampling within POC wells with very low recharge rates, the permittee may conduct the sampling using no-purge sampling techniques using HydraSleeve™ or similar type methodology. The use of HydraSleeve™ or similar type samplers shall follow accepted EPA, USGS, and DOD protocols. In addition, the HydroSleeve™ or similar type sampler shall be placed just below the water table.

An explanation for reduced pumping volumes, a record of the volume pumped, and modified sampling procedures shall be reported and submitted with the Self-monitoring Report Form (SMRF).

2.5.3.1. Point of Compliance Well Replacement

In the event that one or more of the designated POC wells should become unusable or inaccessible due to damage or any other event, a replacement POC well shall be constructed and installed upon approval by ADEQ. If the replacement well is 50 feet or less from the original well, the ALs and/or aquifer quality limits (AQLs) calculated for the designated POC well shall apply to the replacement well.

2.5.3.2. Ambient Groundwater Quality Monitoring for Point of Compliance (POC) Wells

The permittee shall complete 8 rounds of ambient groundwater monitoring for all constituents listed in Section 4.2, Table 12: PARAMETERS FOR AMBIENT GROUNDWATER MONITORING for any new or replacement POC well.

In accordance with Table 5: COMPLIANCE SCHEDULE ITEMS, the permittee shall complete 8 rounds of ambient groundwater monitoring for POC wells M52-UBF (replacement for M32-UBF) and M33-UBF (replacement) for the constituents listed in Section 4.2, Table 12.

2.5.3.3. Alert Levels (ALs) for Point of Compliance Wells

ALs shall be calculated for all contaminants with an established numeric AWQS for any new or replacement POC wells, unless otherwise specified in this permit.

The permittee shall submit the ambient groundwater data in tabulated form to the Groundwater Protection Value Stream for review. Copies of all laboratory analytical reports, field notes, and the Quality Assurance/Quality Control (QA/QC) procedures used in collection and analyses of the samples for all parameters listed in Section 4.2, Table 13: QUARTERLY GROUNDWATER COMPLIANCE MONITORING and Table 14: ANNUAL GROUNDWATER MONITORING to be established for each POC well, shall be submitted to the Groundwater Protection Value Stream. The permittee may submit a report with the calculations for each AL and AQL included in the permit for review and approval by ADEQ, or the permittee may defer calculation of the ALs and AQLs by the Groundwater Protection Value Stream. The ALs shall be established and calculated following acceptable statistical guidance such as the *USEPA Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities Unified Guidance* (EPA 530-R-09-007)

The following criteria shall be met in establishing ALs in the permit:

1. The AL shall be calculated for a parameter using the analyses from a minimum of8 sampling events.
2. Any data where the laboratory Practical Quantitation Limit (PQL) exceeds 80% of the AWQS shall not be included in the AL calculation.
3. If a parameter is below the detection limit, the permittee must report the value as “less than” the numeric value for the PQL or detection limit for the parameter, not just as “non-detect”. For those parameters, the permittee shall use a value of one-half the reported detection limit for the AL calculation.
4. If the analytical results from more than 50% of the samples for a specific parameter are non-detect, then the AL shall be set at 80% of the AWQS.
5. If the calculated AL for a specific constituent and well is less than 80% of the AWQS, the AL shall be set at 80% of the AWQS for that constituent in that well.

2.5.3.4. Aquifer Quality Limits for POC Wells

For each of the monitored analytes for which a numeric AWQS has been adopted, the AQL shall be established as follows:

1. If the calculated AL is less than the AWQS, then the AQL shall be set equal to the AWQS.
2. If the calculated AL is greater than the AWQS, then the AQL shall be set equal to the calculated AL value, and no AL shall be set for that constituent at that monitoring point.

2.5.3.5. Quarterly Compliance Groundwater Quality Monitoring for POC Wells

Except for replacement POC wells, which shall be sampled upon the completion of the ambient groundwater sampling period, quarterly compliance groundwater monitoring in each POC well shall commence within the first calendar quarter after the effective date of this permit. For quarterly compliance monitoring, the permittee shall analyze groundwater samples for the parameters listed in Section 4.2, Table 13: QUARTERLY GROUNDWATER COMPLIANCE MONITORING.

2.5.3.6. Annual Compliance Groundwater Quality Monitoring for POC Wells

The permittee shall perform annual compliance monitoring of the POC wells as specified in Table 14: ANNUAL GROUNDWATER MONITORING. The results of the monitoring shall be compared to the AQLs and ALs The permittee shall submit reports of the annual compliance monitoring in accordance with the reporting schedule at Section 2.7.6.

2.5.3.7. Alert Levels for Well Bore Electrical Conductivity Monitoring

1. The permittee shall establish the well bore electrical conductivity (EC) AL value for each resource block prior to Injection and Recovery (I/R) operations. The AL value will be established as a Background Threshold Value (BTV), which will be calculated from ambient baseline measurements from all wells within a resource block. For smaller sized resource blocks with less than 4 wells, the BTV from the nearest adjacent resource block will be used. The acquired conductivity data will be analyzed as follows:
2. The BTV for each resource block will be calculated using ProUCL1, a software package developed by the EPA.
3. A minimum of3 background well bore conductivity measurements will be taken at each Class III well during a two week period. Measurements shall commence a minimum of 2 weeks after the well annular space has been sealed with cement.
4. Historical conductivity measurements from previously developed resource blocks will be evaluated to identify long-term trends and temporal variation within the ISCR well field. This information will be quantified by using descriptive statistics and/or other applicable statistical tools. The data sets will be updated quarterly as more measurements are obtained throughout ISCR operations. This information will be used to compare the data distribution of conductivity measurements of newly developed resource blocks to: 1) ensure that the newly acquired data of a given resource block is within the expected range of conductivity measurements; 2) is representative; and 3) and has similar variance. For the initial resource block, EC measurements from the PTF observation wells will be used to assess the newly acquired measurements.
5. The permittee shall submit a report with the calculations for the newly established AL for review and approval by ADEQ in accordance with Sections 2.7.4.3 ISCR Resource Block Pre-operational Report and 3.0 Compliance Schedule. The ALs shall be established and calculated using ProUCL following acceptable statistical guidance such as the USEPA Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities Unified Guidance (EPA 530-R-09-007).

2.5.4. Surface Water Monitoring and Sampling Protocols

Surface water monitoring is not required by this permit.

2.5.5. Analytical Methodology

All samples collected for compliance monitoring shall be analyzed using Arizona state-approved methods. If no state-approved method exists, then any appropriate EPA-approved method shall be used. Regardless of the method used, the detection limits must be sufficient to determine compliance with the regulatory limits of the parameters specified in this permit. If all methods have detection limits higher than the applicable limit, the permittee shall follow the applicable contingency requirements of Section 2.6 and may propose "other actions" including amending the permit to set higher limits. Analyses shall be performed by a laboratory licensed by the Arizona Department of Health Services, Office of Laboratory Licensure and Certification unless exempted under A.R.S. § 36-495.02. For results to be considered valid, all analytical work shall meet quality control standards specified in the approved methods. A list of Arizona state-certified laboratories can be obtained at the address below

Arizona Department of Health Services
Office of Laboratory Licensure and Certification
250 North 17th Avenue
Phoenix, Arizona 85007

1 ProUCL Version 5.1, Technical Guide, Statistical Software for Environmental Applications for Data Sets with and without Non-detect Observations. USEPA, October 2015. EPA/600/R-07/041

Phone: (602) 364-0720

2.5.6. Installation and Maintenance of Monitoring Equipment

Monitoring equipment required by this permit shall be installed and maintained so that representative samples required by the permit can be collected. If new operational, monitoring or POC wells are determined to be necessary, the construction details shall be submitted to the Groundwater Protection Value Stream for approval prior to installation and the permit shall be amended to include any new wells.

2.5.7. Protection of Downgradient Uses - Arsenic

For purposes of this permit, ADEQ has established a use protection level (UPL) for arsenic of 0.01 milligrams per liter (mg/L), consistent with EPA's primary drinking water standard for arsenic. The northwest corner of the State Mineral Lease Land, on which the PTF is located, has been conservatively designated as the downgradient point at which the arsenic UPL will be applied. Consistent with ADEQ's substantive policy statement titled "Using Narrative Aquifer Water Quality Standards to Develop Permit Conditions for Aquifer Protection Permits" (Oct. 2003), an alert level for arsenic shall be established for POC wells M14-GL, M15-GU, M22-O, and M23-UBF for the in-situ well field through consideration of fate and transport of arsenic in groundwater to ensure that the UPL is not exceeded at the northwest corner of the State Mineral Lease Land.

2.5.8. BADCT Monitoring Wells (Non-POC)

2.5.8.1. Observation Wells

Observation wells shall be installed and approved by ADEQ in accordance with ISCR Resource Block Pre-operational Report requirements, Section 2.7.4.3 and the Compliance Schedule, Section 3.0. The Observation wells are located outside of resource blocks between perimeter wells and POC/water level wells in order to provide data for inward hydraulic gradient, well bore electrical conductivity monitoring and fluid electrical conductivity monitoring. These wells are also used in generating potentiometric surface maps. The Observation well monitoring requirements are provided in Section 4.2, Table 15: IN-SITU BADCT MONITORING. Observation wells associated with the PTF Well Field are listed in Table 17: PTF OBSERVATION WELLS. Observation wells associated with the ISCR Resource Blocks will be listed in Table 18: RESOURCE BLOCK WELLS.

2.5.8.2. Perimeter Wells

Perimeter wells shall be installed and approved by ADEQ in accordance with ISCR Resource Block Pre-operational Report requirements, Section 2.7.4.3 and the Compliance Schedule, Section 3.0. The Perimeter wells are located immediately adjacent to resource blocks in order to provide data for inward hydraulic gradient, well bore electrical conductivity monitoring and are also used in generating potentiometric surface maps. The Perimeter well monitoring requirements are provided in Section 4.2, Table 15: IN-SITU BADCT MONITORING. Perimeter wells associated with the ISCR Resource Blocks will be listed in Table 18: RESOURCE BLOCK WELLS.

2.5.8.3. Rinse Verification Wells

Rinse verification wells shall be proposed by the permittee and approved by ADEQ in accordance with Quarterly Report requirements, Section 2.7.4.2.1 and the Compliance Schedule, Section 3.0. Rinse verification wells are a subset of the injection and recovery wells to be used to monitor groundwater in a resource block after it has been rinsed per Section 2.9.1. Rinse Verification wells associated with the ISCR Resource Blocks will be listed in Table 18: RESOURCE BLOCK WELLS. The PTF Well Field will be incorporated into one of the ISCR Resource Blocks.

2.6. CONTINGENCY PLAN REQUIREMENTS

[A.R.S. § 49-243(K)(3), (K)(7) and A.A.C. R18-9-A204 and R18-9-A205]

2.6.1. General Contingency Plan Requirements

At least one copy of this permit and the approved contingency and emergency response plan submitted in the application shall be maintained at the location where day-to-day decisions regarding the operation of the facility are made. The permittee shall be aware of and follow the contingency and emergency plans.

Any AL exceedance, or violation of an AQL, DL, or other permit condition shall be reported to ADEQ following the reporting requirements in Section 2.7.3, unless more specific reporting requirements are set forth in Sections 2.6.2 through 2.6.5.

Some contingency actions involve verification sampling. Verification sampling shall consist of the first follow-up sample collected from a location that previously indicated a violation or the exceedance of an AL. Collection and analysis of the verification sample shall use the same protocols and test methods to analyze for the pollutant or pollutants that exceeded an AL or violated an AQL or DL. Where verification sampling is specified in this permit, it is the option of the permittee to perform such sampling. If verification sampling is not conducted within the timeframe allotted, ADEQ and the permittee shall presume the initial sampling result to be confirmed as if verification sampling had been conducted. The permittee is responsible for compliance with contingency plans relating to the exceedance of an AL or violation of a DL, AQL or any other permit condition. The permittee is subject to enforcement action for the failure to comply with any contingency actions in this permit.

2.6.2. Exceedance of Performance Levels and Alert Levels

2.6.2.1. Exceedance of Performance Levels for Operational Conditions

2.6.2.1.1. Performance Levels for Freeboard

In the event that freeboard performance levels for a surface impoundment as required by Section 4.2, Table 10: REQUIRED INSPECTIONS AND OPERATIONAL MONITORING are not maintained, the permittee shall:

1. As soon as practicable, cease or reduce discharging to the impoundment to prevent overtopping. Remove and properly dispose or recycle to other operations the excess fluid in the impoundment until the water level is restored at or below the freeboard performance level.
2. Within 5 days of discovery, evaluate the cause of the incident and adjust operational conditions or identify design improvements to the affected impoundment system as necessary to avoid future occurrences.
3. Within 30 days of discovery, initiate repairs to the affected impoundment system, structure, or other component as necessary to return the water level in the impoundment to at or below the freeboard performance level. Record any repair procedures, methods, and materials used to restore the facility to operating condition in the facility log/recordkeeping file.
4. If design improvements are necessary, submit an amendment application within 90 days of discovery.
5. The facility is no longer on alert status once the operational indicator no longer indicates that the freeboard performance level is being exceeded. The permittee shall, however, complete all tasks necessary to return the facility to its pre-alert operating condition.

2.6.2.1.2. Performance Levels Other Than Freeboard

1. If an operational performance level (PL) listed in Section 4.2, Table 10: REQUIRED INSPECTIONS AND OPERATIONAL MONITORING has been observed or noted during required inspection and operational monitoring, such that the result could cause or contribute to an unauthorized discharge, the permittee shall immediately investigate to determine the cause of the condition. The investigation shall include the following.

    a. Inspection, testing, and assessment of the current condition of all treatment or pollutant discharge control systems that may have contributed to the operational performance condition.

    b. Review of recent process logs, reports, and other operational control information to identify any unusual occurrences

2. The PL exceedance, results of the investigation, and any corrective action taken shall be reported to the Groundwater Protection Value Stream, within 30 days of the discovery of the condition. Upon review of the submitted report, the Department may amend the permit to require additional monitoring, increased frequency of monitoring, or other actions.

3. The permittee shall initiate actions identified in the approved contingency plan referenced in Section 2.6.1 and any necessary contingency measures to resolve problems identified by the investigation which may have led to a PL exceedance. To implement any other corrective action the permittee may choose to obtain prior approval from ADEQ according to Section 2.6.6

2.6.2.2. Exceedance of Alert Level #1 for Normal Liner Leakage

If an Alert Level #1 (AL #1) as specified in Section 4.2, Table 11: LEAK COLLECTION AND REMOVAL SYSTEM MONITORING, has been exceeded, the permittee shall take the following actions:

NOTE: The notification and reporting identified in this section is in lieu of the reporting requirement in Section 2.7.3 Permit Violation and Alert Level Status Reporting.

1. Within 5 days of AL #1 exceedance, notify Groundwater Protection Value Stream. Continue monitoring to determine if the leakage rate is increasing.
2. If the leakage rate continues to exceed AL#1 for 15 days following notification of initial AL #1 exceedance, perform a visual inspection of the liner above the solution level, to determine the location of the leaks in the primary liner.
3. Within 45 days of AL #1 exceedance, if liner damage is evident, the permittee shall complete liner repairs.
4. Within 45 days of AL #1 exceedance, if the visual inspection does not identify the location of leak(s), formulate a corrective action plan to determine the location of the leak(s) and repair them. Liner repair shall be completed within 90 days of the AL #1 exceedance.
5. Within 75 days of AL #1 exceedance (if repairs were completed in Step 3), or 120 days of AL #1 exceedance (if corrective action plan was implemented per Step 4), if no alert level exceedance is observed for 30 consecutive days, notify Groundwater Protection Value Stream and document assessment and/or repairs in the log book.
6. Within 120 days of AL #1 exceedance (if repairs were completed in Step 3), or 165 days of AL #1 exceedance (if corrective action plan was implemented per Step 4), if 30 consecutive days without an AL #1 exceedance is not achieved, notify Groundwater Protection Value Stream and reassess the entire liner system and complete any necessary repairs as described in Steps 2 and 3 (and if necessary Step 4). Repeat the assessment and liner repair cycle until the requirement of Step No. 5is attained.
7. A liner leakage assessment and repair report shall be included in the next annual report described in Section 2.7.4.1 (Annual Reporting) of this permit. The permittee may also submit the liner leakage assessment report to the ADEQ prior to the annual report due date. This liner leakage assessment and repair report shall be submitted to Groundwater Protection Value Stream. Upon review of the report, ADEQ may require that the permittee take additional corrective actions to address the problems identified from the assessment of the liner.

2.6.2.3. Exceedance of Alert Level #2 for Liner Failure or Rips

If the Liner Leakage Alert Level #2 (AL #2) specified in Section 4.2, Table 11: LEAK COLLECTION AND REMOVAL SYSTEM MONITORING has been exceeded, the permittee shall:

NOTE: The notification and reporting identified in this section is in lieu of the reporting requirement in Section 2.7.3 Permit Violation and Alert Level Status Reporting.

1. As soon as practicable, cease all discharge to the impoundment, implement control measures to prevent new solution buildup and immediately notify Groundwater Protection Value Stream of the AL #2 exceedance.
2. Within 15 days of initial AL #2 exceedance, perform a visual inspection of the liner above the solution level to identify the location of the leak(s). The permittee shall complete liner repairs. Discharge to the impoundment shall not be re-initiated until the leak(s) have been identified and repaired.
3. Within 60 days of initial AL #2 exceedance, if leaks were found and fixed and if no AL #2 exceedance is observed for 30 consecutive days, submit a liner leakage assessment and repair report to ADEQ. The report shall include the results of the initial liner evaluation, methods used to locate the leak(s), repair procedures and quality assurance/quality control implemented to restore the liner to optimal operational status, and actions taken by the permittee to prevent future leaks.
4. Within 30 days of initial AL #2 exceedance, if the visual inspection does not identify the location of the leak(s) and AL #2 exceedance continues, formulate a corrective action plan to determine the location of the leak(s) and repair them. The corrective action plan may take into account the schedule for a 3rd party contractor to perform electronic leak detection or other methods, if required. Liner repair shall be completed within 75 days of the AL #2 exceedance.
5. Within 105 days of AL #2 exceedance and implementation of the corrective action plan per Step 4, if no AL #2 exceedance is observed for 30 consecutive days, notify Groundwater Protection Value Stream and document assessment and/or repairs in the log book.
6. Within 105 days of initial AL #2 exceedance, (if repairs were completed in Step 3), or 150 days of AL #2 exceedance (if corrective action plan was implemented per Steps 4 and 5) if 30 consecutive days without an AL #2 exceedance is not achieved, repeat Steps 1 through 6 until AL #2 is not exceeded for 30 consecutive days. When the Steps 1 through6 are repeated, the notification date is reset. Discharge to the impoundment shall not be re-initiated until the leak(s) have been identified and repaired.
7. Liner leakage assessment and repair reports required by Section 2.6.2.2, shall be referenced in the next annual report described in Section 2.7.4.1 (Annual Reporting) of this permit.

2.6.2.4. Exceedance of Alert Levels Set for Discharge Monitoring

Not Applicable.

2.6.2.5. Exceedance of Alert Levels in Groundwater Monitoring

2.6.2.5.1. Alert Levels for Indicator Parameters

1. If an AL for an indicator parameter set in Section 4.2, Table 13: QUARTERLY GROUNDWATER COMPLIANCE MONITORING has been exceeded, the permittee may conduct verification sampling within 5 days of becoming aware of the AL exceedance. The permittee may use the results of another sample taken between the date of the last sampling event and the date of receiving the result as the verification sample.

   If verification sampling confirms the AL exceedance or if the permittee opts not to perform verification sampling, then the permittee shall increase the frequency of monitoring to monthly for the entire list of parameters listed in Section 4.2, Table 13: QUARTERLY GROUNDWATER COMPLIANCE MONITORING and the parameter(s) with the exceedance, and increase the frequency of monitoring to semi-annually for the parameters listed in Section 4.2, Table 14: ANNUAL GROUNDWATER MONITORING.

2. The permittee shall continue increased frequency monitoring as described in Section 2.6.2.5.1.1 until all indicator parameters have remained below their respective ALs for 4 consecutive sampling events.

2.6.2.5.2. Alert Levels for Pollutants with Numeric Aquifer Water Quality Standards

1. If an AL for a pollutant set in Section 4.2, Table 14: ANNUAL GROUNDWATER MONITORING has been exceeded, the permittee may conduct verification sampling of the pollutant(s) that exceed their respective AL(s) within 5 days of becoming aware of an AL exceedance. The permittee may use the results of another sample taken between the date of the last sampling event and the date of receiving the result as verification.

2. If verification sampling confirms the AL exceedance or if the permittee opts not to perform verification sampling, then the permittee shall increase the frequency of monitoring for the pollutant(s) exceeding their respective AL(s) to monthly. In addition, the permittee shall immediately initiate an investigation of the cause of the AL exceedance, including inspection of all discharging units and all related pollution control devices, review of any operational and maintenance practices that might have resulted in an unexpected discharge, and hydrologic review of groundwater conditions including upgradient water quality.

3. The permittee shall initiate actions identified in the approved contingency plan referenced in Section 5.0 and specific contingency measures identified in Section 2.6 to resolve any problems identified by the investigation which may have led to an AL exceedance. To implement any other corrective action the permittee shall obtain prior approval from ADEQ according to Section 2.6.6. Alternatively, the permittee may submit a technical demonstration, subject to written approval by the Groundwater Protection Value Stream, that although an AL is exceeded, the pollutant(s) that exceed their respective AL(s) are not reasonably expected to cause a violation of an AQL. As a result of the demonstration, the permittee may propose a revised AL or monitoring frequency, for those pollutant(s) that exceed their respective AL(s). Such proposal shall be submitted in writing for approval by the Groundwater Protection Value Stream.

4. Within 30 days after confirmation of an AL exceedance for those pollutant(s), the permittee shall submit the laboratory results to the Groundwater Protection Value Stream along with a summary of the findings of the investigation, the cause of the AL exceedance, and actions taken to resolve the problem.

5. Upon review of the submitted report and advance notice to the permittee, the Department may amend the permit to require additional monitoring, increased frequency of monitoring, or other actions.
6. The increased monitoring for those pollutant(s) required as a result of an AL exceedance may be reduced to the frequency shown for groundwater monitoring in Section 4. 2 Table 14: ANNUAL GROUNDWATER MONITORING, if the results of three (3) sequential sampling events demonstrate that the parameter(s) does/do not exceed their respective AL(s).
7. If the increased monitoring required as a result of an AL exceedance for those pollutant(s) continues for more than 6 sequential sampling events, the permittee shall submit a second report documenting an investigation of the continued AL exceedance within 30 days of the receipt of laboratory results of the sixth sampling event.

2.6.2.5.3. Alert Levels to Protect Downgradient Users from Pollutants Using a Narrative Aquifer Water Quality Standard

1. If an AL for Arsenic set in Section 4.2, Table 14: ANNUAL GROUNDWATER MONITORING for M14-GL, M15-GU, M22-O, and M23-UBF has been exceeded, the permittee shall conduct verification sampling for the pollutant(s) exceeding their respective AL(s) within 5 days of becoming aware of an AL exceedance.
2. If verification sampling confirms that the AL has been exceeded, the permittee shall investigate the cause of the exceedance and shall submit a report regarding the exceedance to ADEQ within 30 days of the receipt of confirmation from the verification sample. The report shall identify the cause and source(s) of the exceedance and shall propose actions to mitigate the exceedance. The report shall also present groundwater modeling to establish a projected relationship of the wells in which exceedance(s) were found and the downgradient boundary of the Arizona State Mineral Lease Land at the facility.
3. The permittee shall also immediately notify all downgradient users of the aquifer within 1.5 miles of the discharge within 24 hours of receiving the results of verification confirmation sampling.

2.6.2.6. Exceeding of BADCT Alert Levels for Injection/Recovery Well Operations

The permittee shall initiate the following actions within 24 hours of becoming aware of an Alert Level exceedance listed in Section 4.2 Table 15: IN-SITU BADCT MONITORING for the loss of hydraulic control within the ISCR area for more than 24 consecutive hours. A loss of hydraulic control occurs when the amount of fluids injected during a 24 hour period exceeds the amount of fluid recovered for the same 24 hour period. Loss of hydraulic control is also indicated by a less than 1-foot differential as a daily average between pairs of recovery/perimeter wells and POC wells. The permittee shall:

1. Notify the ADEQ Groundwater Protection Value Stream within one (1) day of becoming aware of the alert level exceedance;
2. Adjust flow rates at injection/recovery wells until the recovery volume is greater than the injected volume;
3. Conduct an inspection, testing of piping, and wellhead for leaks; injection and recovery lines, pumps, flow meters, totalizers, pressure gauges, pressure transducers, and other associated facilities;
4. Review of recent process logs, continuous chart recordings, meter readings, and other operational control information to identify any unusual occurrences;
5. Initiate pressure testing of the appropriate wells if the loss of fluids cannot be determined to be caused by a surface facility failure;
6. Repair system as necessary;
7. Within one week submit a report to Groundwater Protection Value Stream. The report shall include the following information: a) injected volume during the week prior to the alert level exceedance; b) recovered volume in the period prior to the alert level exceedance; and, c) corrective action taken;
8. The permittee is no longer considered to be in violation if the injection rate and recovery rates are re-established and maintained at normal operating conditions following the completion of the corrective actions;
9. If the exceedance of the Alert Level is determined to be a result of a planned disruption or power outage, the cause will be noted in the log book as required by Section 2.7.2;
10. If a leak is detected, operation of the well shall cease until the leak has been repaired and mechanical integrity demonstrated to minimize the potential for groundwater pollution;
11. Within 30 days of the initial AL exceedance caused by a leak, the permittee shall submit a report to ADEQ Groundwater Protection Value Stream at the address shown in Section 2.7.5. This report shall document all submittals to EPA, including but not limited to, monitoring and report data and reports checking engineering and integrity of the well; and,
12. The facility is no longer on alert status once the operational indicator no longer indicates that an AL is being exceeded. The permittee shall, however, complete all tasks necessary to return the facility to its pre-alert operating condition.

2.6.2.7. Exceeding of Alert Levels Set for Maximum Injection Pressures

The permittee shall initiate the following actions within 24 hours of becoming aware of an Alert Level exceedance listed in Section 4.2, Table 15: IN-SITU BADCT MONITORING for the exceedance of a fracture gradient. The permittee shall:

1. Immediately investigate to determine the cause of the AL being exceeded, including:

    a. Inspection, testing, and assessment of the current condition of all components of the injection system that may have contributed to the AL being exceeded, which may include taking the affected well(s) out of service;

    b. Review of all data logger information, test results, and other operational control information to identify any unusual occurrences; and,

    c. Repair system as necessary.

2. Within 30 days of an AL being exceeded, the permittee shall submit to the Groundwater Protection Value Stream, a summary of the findings of the investigation, all data acquired for the investigations, the cause of the AL being exceeded, and actions taken to resolve the problem. This report shall document all submittals to EPA, including but not limited to, monitoring and report data and reports checking engineering and integrity of the well.

3. Upon review of the submitted report and advance written notice to the permittee, the Department may amend the permit to require additional monitoring, increased frequency of monitoring, amendments to permit conditions or other actions.

4. The facility is no longer on alert status once the operational indicator no longer indicates that an AL is being exceeded. The permittee shall, however, complete all tasks necessary to return the facility to its pre-alert operating condition.

2.6.2.8. Exceeding Alert Levels for Well Bore Electrical Conductivity

The permittee shall initiate the following actions within 24 hours of becoming aware of an Alert Level exceedance listed in Section 4.2, Table 15: IN-SITU BADCT MONITORING for the exceedance of Well Bore Electrical Conductivity at an annular conductivity device. The permittee shall:

1. Verify the reading from the annular conductivity device, to confirm there was an AL exceedance. Within 14 days of the AL exceedance, the permittee shall collect 3 additional independent conductivity measurements conducted over a period of 6 days. If additional measurements do not confirm an AL exceedance, the permittee can resume normal operations and notify the Groundwater Protection Value Stream in accordance with Section 2.7.3. No further action is required until the next monitoring round.
2. If the 3 additional independent conductivity measurements verify an AL exceedance, the permittee shall:
    a. Notify the Groundwater Protection Value Stream of the AL exceedance within one day of verifying the alert level exceedance.
    b. Obtain1 additional reading from each annular conductivity device at the three wells nearest to the subject well within 5 days of verifying to evaluate the possibility of fluid migration through the lower basin fill unit (LBFU).
3. Within 30 of verifying the alert level exceedance, the permittee shall submit a written report to the Groundwater Protection Value Stream providing an evaluation of the cause, impacts, and mitigation of the discharge responsible for the increase in conductivity, or submit a report which demonstrates that the increase resulted from error in conductivity measurement, data analysis, or statistical evaluation.
4. If an AL exceedance is verified, the permittee shall:
    a. Reduce the injection rate and increase the extraction rate in the area of increased conductivity values for a period of time equal to the period spanning from the previous measurement, wherein conductivity values were within range of background values, until the time when the AL exceedance was verified.
    b. Increase well bore electrical conductivity monitoring frequency from quarterly to monthly.
    c. Repair the system as necessary.
    d. Within 30 days of repairing the system, the permittee shall submit a written report to the Groundwater Protection Value Stream documenting the repair of the system and providing an evaluation of the cause, impacts, and mitigation of any impacts to the LBFU, MFGU, and/or the Upper Basin Fill Unit (UBFU).
    e. If the conductivity values remain at levels that exceed ALs, and do not return to below the AL after a period of 60 days of reduced injection and increased pumping, the permittee shall:
        a. Increase the sampling frequency for Quarterly Compliance Monitoring parameters at the nearest down gradient Point of Compliance wells to monthly, and Annual Compliance Monitoring parameters to quarterly.
        b. Submit a plan to correct the condition to the Groundwater Protection Value Stream

2.6.2.9. Exceeding Alert Levels for Fluid Electrical Conductivity

The permittee shall initiate the following actions within 24 hours of becoming aware of an Alert Level exceedance listed in Section 4.2, Table 15: IN-SITU BADCT MONITORING for the exceedance of fluid sample electrical conductivity. The permittee shall:

1. Immediately verify the fluid sample electrical conductivity. If the verification sample does not confirm that an exceedance has occurred, no further action is required.
2. Within 24-hours of confirmation of an AL being exceeded, the permittee shall notify the Groundwater Protection Value Stream and immediately investigate the cause of the exceedance.
3. The permittee shall report the results of the investigation within 30 days of confirmation. ADEQ may require reduction of injection rates and increase of pumping rates, additional investigations, the installation of additional wells or corrective action in response to the report

2.6.2.10. Exceeding an Alert Level for Cone of Depression

The permittee shall initiate the following actions within 24 hours of becoming aware of an Alert Level exceedance listed in Section 4.2, Table 15: IN-SITU BADCT MONITORING for the cone of depression. The permittee shall:

1. Within 48 hour of becoming aware of the Alert Level exceedance, verify whether an exceedance has occurred by completing the following:
    a. Evaluate whether the data collection protocols have been properly followed;
    b. Review field notes for indications of unusual circumstances that may have occurred during the collection of the data;
    c. Review daily injection and pumping values at the ISCR well field at the time of the measurements to confirm that extraction was greater than injection during that period in accordance with Section 2.7.4.4(2), Table 6: PERMITTED FACILITIES AND BADCT and Table 15: IN-SITU BADCT MONITORING.
    d. Evaluate the pumping conditions at other nearby wells during the time of measurements (i.e. were POC, Observation or Perimeter wells being purged);
    e. Inspect the equipment used to collect the field measurements;
    f. Determine if the measurement equipment was different from past collection periods, and evaluate the potential effects of differences between the equipment used; and,
    g. Check the calibration of the equipment used (water sounder, pressure transducers, etc.).
2. If an exceedance is not verified, no further action is required.
3. If an exceedance is verified, the permittee shall:

    a. Reduce the injection rate and increase the pumping rate at the recovery wells to a rate that will cause the cone of depression to no longer exceed the alert level, and notify Groundwater Protection Value Stream within 24 hours.

    b. Increase the frequency of potentiometric surface map compilation to weekly until water level measurements confirm that the cone of depression alert level is no longer exceeded.

    c. If the cone of depression does not meet the alert level after a period of 30 days of reduced injection and increased pumping, the permittee shall immediately cease injecting solutions, continue extracting until the cone of depression no longer exceeds the alert level, increase the frequency of monitoring to monthly for all wells and pollutants in Table 13: QUARTERLY GROUNDWATER COMPLIANCE MONITORING. Upon taking these actions, the permittee shall notify Groundwater Protection Value Stream within 3 days.
4. Once the alert level is no longer exceeded, the permittee shall prepare a summary report to be submitted to the Groundwater Protection Value Stream within 30 days summarizing the findings and actions taken to extend the cone of depression to the PMA boundary.

2.6.3. Discharge Limitations Violations

2.6.3.1. Liner Failure, Containment Structure Failure, or Unexpected Loss of Fluid

In the event of overtopping, liner failure, containment structure failure, or unexpected loss of fluid as described in Section 2.3, the permittee shall take the following actions:

1. As soon as practicable, cease all discharges as necessary to prevent any further releases to the environment, including removal of any fluid remaining in the impoundment as necessary, and capture and containment of all escaped fluids.
2. Within 24 hours of discovery, notify Groundwater Protection Value Stream,
3. Within 24 hours of discovery of a failure estimate the quantity released, collect representative samples of the fluid remaining in affected impoundments and drainage structures, analyze sample(s) according to Section 4.2, Table 9: DISCHARGE MONITORING SAMPLING PARAMETERS and report in accordance with Section 2.7.3 (Permit Violation and AL Status Reporting). In the 30-day report required under Section 2.7.3, include a copy of the analytical results and forward the report to Groundwater Protection Value Stream.
4. Within 15 days of discovery, initiate an evaluation to determine the cause for the incident. Identify the circumstances that resulted in the failure and assess the condition of the discharging facility and liner system. Implement corrective actions as necessary to resolve the problems identified in the evaluation. Initiate repairs to any failed liner, system, structure, or other component as needed to restore proper functioning of the discharging facility. The permittee shall not resume discharge to the facility until repairs of any failed liner or structure are performed. Repair procedures, methods, and materials used to restore the system(s) to proper operating condition shall be described in the facility log/recordkeeping file and available for ADEQ review. Record in the facility log/recordkeeping file the amount of fluid released, a description of any removal method and volume of any fluid removed from the impoundment and/or captured from the release area. The facility log/recordkeeping file shall be maintained according to Section 2.7.2 (Operation Inspection / Log/Recordkeeping File).
5. Within 30 days of discovery of the incident, submit a report to Groundwater Protection Value Stream as specified in Section 2.7.3. Include a description of the actions performed in Subsections 1 through 4 listed above. Upon review of the report, ADEQ may request additional monitoring or remedial actions.
6. Within 60 days of discovery, conduct an assessment of the impacts to soil and/or groundwater resulting from the incident. If soil or groundwater is impacted such that it could or did cause or contribute to an exceedance of an AQL at the applicable point of compliance, submit to ADEQ, for approval, a corrective action plan to address such impacts, including identification of remedial actions and a schedule for completion of activities. At the approval of ADEQ, the permittee shall implement the approved plan.
7. Within 30 days of completion of corrective actions, submit to Groundwater Protection Value Stream, a written report as specified in Section 2.6.6 (Corrective Actions).
8. Upon review of the report and advance written notice to the permittee, ADEQ may amend the permit to require additional monitoring, increased frequency of monitoring, amendments to permit conditions, or other actions.

2.6.3.2. Overtopping a Surface Impoundment

If overtopping of fluid from a permitted surface impoundment occurs, and results in a discharge pursuant to A.R.S. § 49-201(12), the permittee shall:

1. As soon as practicable, cease all discharges to the surface impoundment to prevent any further releases to the environment.
2. Within 24 hours of discovery, notify Groundwater Protection Value Stream.
3. Within 24 hours, collect representative samples of the fluid contained in the surface impoundment. Samples shall be analyzed for the parameters specified in Section 4.2, Table 9: DISCHARGE MONITORING SAMPLING PARAMETERS. Within 30 days of the incident, submit a copy of the analytical results to Groundwater Protection Value Stream.
4. As soon as practicable, remove and properly dispose of excess water in the impoundment until the water level is restored at or below the appropriate freeboard as described in Section 4.2, Table 10: REQUIRED INSPECTIONS AND OPERATIONAL MONITORING. Record in the facility log/recordkeeping file the amount of fluid released, a description of the removal method and volume of any fluid removed from the impoundment and/or captured from the release area. The facility log/recordkeeping file shall be maintained according to Section 2.7.2 (Operation Inspection/Log Book/Recordkeeping File).
5. Within 30 days of discovery, evaluate the cause of the overtopping and identify the circumstances that resulted in the incident. Implement corrective actions and adjust operational conditions as necessary to resolve the problems identified in the evaluation. Repair any systems as necessary to prevent future occurrences of overtopping.
6. Within 30 days of discovery of overtopping, submit a report to ADEQ as specified in Section 2.7.3(2) (Permit Violation and Alert Level Status Reporting). Include a description of the actions performed in Subsections 1 through 5 listed above. Upon review of the report, ADEQ may request additional monitoring or remedial actions.
7. Within 60 days of discovery, and based on sampling in Item No. 3 above, conduct an assessment of the impacts to the subsoil and/or groundwater resulting from the incident.
8. If soil or groundwater is impacted such that it could cause or contribute to an exceedance of an AQL at the applicable point of compliance, submit to ADEQ for approval, a corrective action plan to address such impacts, including identification of remedial actions and/or monitoring, and a schedule for completion of activities. At the direction of ADEQ, the permittee shall implement the approved plan.
9. Within 30 days of completion of corrective actions, submit to ADEQ, a written report as specified in Section 2.6.6 (Corrective Actions). Upon review of the report and advance written notice to the permittee, ADEQ may amend the permit to require additional monitoring, increased frequency of monitoring, amendments to permit conditions, or other actions.

2.6.3.3. Inflows of Unexpected Materials to a Surface Impoundment

The types of materials that are expected to be placed in the permitted surface impoundments are specified in Section 2.3 (Discharge Limitations). If any unexpected materials flow to a permitted surface impoundment, the permittee shall:

1. As soon as practicable, cease all unexpected inflows to the surface impoundment(s);
2. Within 24-hours of discovery, notify Groundwater Protection Value Stream;
3. Within five (5) days of the incident, identify the source of the material and determine the cause for the inflow. Characterize the unexpected material and contents of the affected impoundment, and evaluate the volume and concentration of the material to determine if it is compatible with the surface impoundment liner. Based on the evaluation of the incident, repair any systems or equipment and/or adjust operations, as necessary to prevent future occurrences of inflows of unexpected materials;
4. Within 30 days of an inflow of unexpected materials, submit a report to ADEQ as specified in Section 2.7.3(2) (Permit Violation and Alert Level Status Reporting). Include a description of the actions performed in Subsections 1 through 3 listed above; and,
5. Upon review of the report and advance written notice to the permittee, ADEQ may amend the permit to require additional monitoring, increased frequency of monitoring, amendments to permit conditions, or other actions including remediation..

2.6.3.4. Slopes and Berm Failures

If a slope or berm failure involving retention structures (dams) occurs which affects the ability of the facility to operate in accordance with this permit or results in an unauthorized discharge, the permittee shall promptly close the active area in the vicinity of the failure, and conduct a field investigation of the failure to analyze its origin and extent, its impact on the facility operations, temporary and permanent repairs and changes in operational plans considered necessary. Within 30 days of a slope or berm failure, the permittee shall submit a written report, which includes the documentation specified in Section 2.7.3 of this permit. The permittee shall initiate the actions necessary to mitigate the impacts of the failure, consistent with Department approval.

2.6.3.5. Unexpected Loss of Fluid in the Injection/Recovery Wells

In the event of an unexpected loss of fluid in the injection/recovery wells, such that fluids are released to the surface, vadose zone, or groundwater, the permittee shall:

1. Within two hours of discovery cease injection in the affected area and/or adjust flow rates at injection/recovery wells until an inward hydraulic gradient is reestablished and excess ISCR solutions are recovered necessary to prevent further releases to the environment;
2. Operate the recovery wells in the affected area until the amount of fluid recovered is in excess of the amount of fluid injected during the 24 hour period,;
3. Within 24 hours of discovery, notify ADEQ Groundwater Protection Value Stream;
4. Inspect relevant components such as injection, recovery lines, pumps, flow meters, flow totalizers, pressure gauges, pressure transducers and other associated facilities;
5. Verify proper operations of all facilities within the in-situ leach are;,
6. Within 24 hours of discovery, initiate an evaluation to determine the cause for the incident. Identify the circumstances that resulted in the failure and assess the condition of the well. Implement corrective actions as necessary to resolve the problems identified in the evaluation. Initiate repairs to any system, structure, or other component as needed to restore proper functioning of the well. The permittee shall not resume injecting or discharging until repairs of any failed structure are performed and tested as applicable. Repair procedures, methods, and materials used to restore the system(s) to proper operating condition shall be described in the facility log/recordkeeping file and available for ADEQ review. The facility log/recordkeeping file shall be maintained according to Section 2.7.2 (Operation Inspection / Log/Recordkeeping File);
7. Submit a written report within 30 days to ADEQ as specified in Section 2.7.3 (Permit Violation and AL Status Reporting) describing the incident and the corrective actions taken. Upon review of the report, the Department may require an amendment to the permit to require surface, vadose zone or groundwater monitoring, require installation of additional POCs, increased frequency of monitoring, remedial actions, amendments to permit conditions or other actions; and,
8. Within 30 days of discovery, conduct an assessment of the impacts to the surface, vadose zone and/or groundwater resulting from the incident. If soil or groundwater is impacted, submit to ADEQ, for approval, a corrective action plan to address such impacts, including identification of remedial actions and/or monitoring, and a schedule for completion of activities. The corrective action plan shall be submitted within 60 days of the incident. At the direction of ADEQ, the permittee shall implement the approved plan.

2.6.4. Aquifer Quality Limit Violation

1. If an AQL set in Section 4.2, Table 14: ANNUAL GROUNDWATER MONITORING has been exceeded, the permittee may conduct verification sampling for those pollutant(s) that were above their respective AQL(s) within 5 days of becoming aware of the exceedance. The permittee may use results of another sample taken between the date of the last sampling event and the date of receiving the result as verification.

2. If verification sampling does not confirm an AQL exceedance, no further action is needed under this Section.

3. If verification sampling confirms that the AQL is exceeded for those pollutants that were above their respective AQS(s) or if the permittee opts not to perform verification sampling, then, the permittee shall increase the frequency of monitoring to monthly for those pollutant(s) that exceeded their respective AQLs and shall

    a. Notify ADEQ within 5 days after confirming or learning of the violation, in accordance with Section 2.7.3;

    b. Immediately initiate: (1) a BADCT systems evaluation for the cause of the violation, including inspection of all discharging units and all related pollution control devices, and review of any operational and maintenance practices that might have resulted in unexpected discharge; and (2) a hydrogeologic assessment of the violation, including groundwater modeling, review of groundwater conditions and upgradient water quality, groundwater contours, and an inventory of downgradient well users and types of uses

    The permittee also shall submit a report according to Section 2.7.3, which includes a summary of the findings of the investigation, the cause of the violation, and actions taken to resolve the problem. A verified exceedance of an AQL will be considered a violation unless the permittee demonstrates within 90 days or a longer time period if agreed to by ADEQ that the exceedance was not caused or contributed to by pollutants discharged from the facility. Unless the permittee has demonstrated that the exceedance was not caused or contributed to by pollutants discharged from the facility, the permittee shall consider and ADEQ may require corrective action that may include control of the source of discharge, cleanup of affected soil, surface water or groundwater, and mitigation of the impact of pollutants on existing uses of the aquifer. Corrective actions shall either be specifically identified in this permit, included in an ADEQ approved contingency plan, or separately approved according to Section 2.6.6.

4. Upon review of the submitted report and advance written notice to the permittee, the Department may amend the permit to require additional monitoring, increased frequency of monitoring, or other actions.

5. If the violation continues for 60 days, the permittee shall notify any downgradient users who may be directly affected by the discharge.

6. If the violation continues for 90 days, then the permittee shall prepare and submit for ADEQ approval a hydrogeologic investigation work plan within 30 after receiving the laboratory results of the third sampling event. The work plan shall assess whether the violation is due to natural or anthropogenic causes and, if exceeded values are found to be related to APP-regulated facilities within the permitted facility or results are inconclusive, the nature and extent of the discharge. This hydrogeologic investigation shall become the basis of adjusting permit conditions and/or designing corrective action

2.6.5. Emergency Response And Contingency Requirements For Unauthorized Discharges Not Addressed Elsewhere in Section 2.6

[A.R.S. § 49-201(12) AND PURSUANT TO A.R.S. § 49-241]

2.6.5.1. Duty To Respond

The permittee shall act immediately to correct any condition resulting from a discharge pursuant to A.R.S. § 49-201(12) if that condition could pose an imminent and substantial endangerment to public health or the environment.

2.6.5.2. Discharge Of Hazardous Substances Or Toxic Pollutants

In the event of any unauthorized discharge pursuant to A.R.S. § 49-201(12) of suspected hazardous substances (A.R.S. § 49-201(19)) or toxic pollutants (A.R.S. § 49-243(I)) on the facility site, the permittee shall promptly isolate the area and attempt to identify the discharged material. The permittee shall record information, including name, nature of exposure and follow-up medical treatment, if necessary, on persons who may have been exposed during the incident. The permittee shall notify the Groundwater Protection Value Stream within 24 hours of discovering the discharge of hazardous material which (a) has the potential to cause an AWQS or AQL exceedance, or (b) could pose an endangerment to public health or the environment.

2.6.5.3. Discharge Of Non-Hazardous Materials

In the event of any unauthorized discharge pursuant to A.R.S. § 49-201(12) of non-hazardous materials from the facility, the permittee shall promptly attempt to cease the discharge and isolate the discharged material. Discharged material shall be removed and the site cleaned up as soon as possible. The permittee shall notify the Groundwater Protection Value Stream within 24 hours of discovering the discharge of non-hazardous material which has the potential to cause an AQL exceedance, or could pose an endangerment to public health or the environment.

2.6.5.4. Reporting Requirements

The permittee shall submit a written report for any unauthorized discharges reported under Sections 2.6.5.2 and 2.6.5.3 to the Groundwater Protection Value Stream within 30 days of the discharge or as required by subsequent ADEQ action. The report shall summarize the event, including any human exposure, and facility response activities and include all information specified in Section 2.7.3. If a notice is issued by ADEQ subsequent to the discharge notification, any additional information requested in the notice shall also be submitted within the time frame specified in the notice. Upon review of the submitted report and advance written notice to the permittee, ADEQ may require additional monitoring or corrective actions.

2.6.6. Corrective Actions

Specific contingency measures identified in Section 2.5.8.1 and actions identified in the approved contingency plan referenced in Section 5.0 have already been approved by ADEQ and do not require written approval to implement.

With the exception of emergency response actions taken under Section 2.6.5, the permittee shall obtain written approval from the Groundwater Protection Value Stream prior to implementing a corrective action to accomplish any of the following goals in response to exceedance of an AL, AQL, DL, or other permit condition:

1. Control of the source of an unauthorized discharge;
2. Soil cleanup;
3. Cleanup of affected surface waters;
4. Cleanup of affected parts of the aquifer; and,
5. Mitigation to limit the impact of pollutants on existing uses of the aquifer.

Within 30 days of completion of any corrective action, the operator shall submit to the Groundwater Protection Value Stream, a written report describing the causes, impacts, and actions taken to resolve the problem.

2.7. REPORTING AND RECORDKEEPING REQUIREMENTS

[A.R.S. § 49-243(K)(2) and A.A.C. R18-9-A206(B) and R18-9-A207]

2.7.1. Self-Monitoring Report Form

1. The permittee shall complete the Self-Monitoring Reporting Forms (SMRFs) provided by ADEQ, and submit the completed report through the myDEQ online reporting system. The permittee shall use the format devised by ADEQ.
2. The permittee shall complete the SMRF to the extent that the information reported may be entered on the form. If no information is required during a reporting period, the permittee shall enter “not required” on the form, include an explanation, and submit the form to the Groundwater Protection Value Stream.
3. The following tables contained in Section 4.0 list the monitoring parameters and the frequencies for reporting results on the SMRF:
    a. Table 13: QUARTERLY GROUNDWATER COMPLIANCE MONITORING
    b. Table 14: ANNUAL GROUNDWATER MONITORING

The parameters listed in the above-identified tables from Section 4.0 are the only parameters for which SMRF reporting is required.

2.7.2. Operation Inspection / Log Book Recordkeeping

A signed copy of this permit shall be maintained at all times at the location where day-to-day decisions regarding the operation of the facility are made. A log book (paper copies, forms, or electronic data) of the inspections and measurements required by this permit shall be maintained at the location where day-to-day decisions are made regarding the operation of the facility. The log book shall be retained for 10 years from the date of each inspection, and upon request, the permit and the log book shall be made immediately available for review by ADEQ personnel. The information in the log book shall include, but not be limited to, the following information as applicable:

1. Name of inspector;
2. Date and shift inspection was conducted;
3. Condition of applicable facility components;
4. Any damage or malfunction, and the date and time any repairs were performed;
5. Documentation of sampling date and time; and,
6. Any other information required by this permit to be entered in the log book.
7. Monitoring records for each measurement shall comply with A.A.C. R18-9-A206(B)(2).

2.7.3. Permit Violation And Alert Level Status Reporting

1. The permittee shall notify the Groundwater Protection Value Stream within 5 days (except as provided in Section 2.6.5) of becoming aware of an AL exceedance, or violation of any permit condition, AQL, or DL for which notification requirements are not specified in Sections 2.6.2 through 2.6.5.
2. The permittee shall submit a written report to the Groundwater Protection Value Stream within 30 days of becoming aware of the violation of any permit condition, AQL, or DL. (NOTE: This reporting requirement is not applicable to Sections 2.6.2.2 and 2.6.2.3 related to alert level exceedance for liner leakage). The report shall document all of the following:
    a. Identification and description of the permit condition for which there has been a violation and a description of the cause;
    b. The period of violation including exact date(s) and time(s), if known, and the anticipated time period during which the violation is expected to continue;
    c. Any corrective action taken or planned to mitigate the effects of the violation, or to eliminate or prevent a recurrence of the violation;
    d. Any monitoring activity or other information which indicates that any pollutants would be reasonably expected to cause a violation of an AWQS;
    e. Proposed changes to the monitoring which include changes in constituents or increased frequency of monitoring; and
    f. Description of any malfunction or failure of pollution control devices or other equipment or processes.

2.7.4. Operational, Other Or Miscellaneous Reporting

2.7.4.1. Annual Report

The permittee shall submit annual reports to ADEQ that include updates to the groundwater model and results of any liner assessment triggered by permit contingency requirements. Annual reports shall be submitted no later than 30 days following the end of the calendar year as specified in the Compliance Schedule, Section 3.0. The annual report shall include the Groundwater Flow Model Evaluation and Update Report and the Liner Leakage Assessment Report (if applicable). Appropriate contents of the report shall be sealed by an Arizona professional geologist or professional engineer, in accordance with Arizona Board of Technical Registration requirements

2.7.4.1.1. Groundwater Flow Model Evaluation and Update Report

The groundwater flow model shall assess the performance of the operating resource blocks, rinsing of resource blocks, and any changes to the post-closure period required by this permit and recommend adjustments to the post-closure monitoring period based on updated groundwater flow modeling results. The groundwater flow model evaluation and update report shall include:

1. Incorporation of hydrologic and lithologic data generated from aquifer tests, routine monitoring, and operation of existing ISCR wells;
2. Inclusion of pumping data from new production wells installed within one mile radius of the wellfield;
3. Comparison and incorporation of hydraulic conductivity values generated from one constant rate aquifer test conducted in each new resource block in which wells were installed during the previous year. If measured hydraulic conductivity values differ from those used in the model, the values will be updated in the model for the affected area and the model will be run to test the model calibration;
4. Comparison and incorporation of porosity values determined from neutron porosity logs run in one well in each new resource block in which wells were installed during the previous year. If measured porosity values differ from those used in the model, the values will be updated in the model for the affected area and the model will be run to test the model calibration; and,
5. Comparison of observed drawdown to model simulated drawdown. The cone of depression resulting from pumping operational ISCR wells will be monitored at the observation, perimeter, and POC wells during ISCR operations. On an annual basis, permittee shall evaluate the magnitude of the observed cone of depression and compare the monitored conditions to the model results. If the magnitude of the measured cone of depression is similar to that generated by the model, the model will be considered to be representative of existing hydraulic conditions.

2.7.4.1.2. Liner Assessment Report

If an Alert Level #1 has been exceeded discussed in Section 2.6.2.2 and/or 2.6.2.3, the permittee shall submit an annual report that summarizes the results of the liner assessment. The Liner Leakage Assessment Report shall also include information including but not limited to the following: number and location of holes identified; and a table summarizing alert level exceedances including the frequency and quantity of fluid removed, and corrective actions taken

2.7.4.2. Quarterly Report

The permittee shall submit quarterly reports concerning the operations and monitoring of the ISCR well field to the Groundwater Protection Value Stream. Quarterly Reports shall be submitted as specified in the Compliance Schedule, Section 3.0 and shall include the Operations and Monitoring Report and Well Abandonment Report. Appropriate contents of the report shall be sealed by an Arizona professional geologist or professional engineer, in accordance with Arizona Board of Technical Registration requirements.

2.7.4.2.1. Operations and Monitoring Report

The report shall be submitted as part of a Quarterly Report per Section 3.0, Compliance Schedule. The report shall demonstrate whether the hydraulic control was maintained during the quarterly monitoring period. Hydraulic control shall be demonstrated by, including but not limited to, the following: maintaining a cone of depression that extends to the PMA boundary associated with the ISCR well field by pumping more solution out than went in, maintaining a 1-foot difference between pairs of recovery/perimeter wells and POC wells as a daily average, maintaining pressure below the fracture gradient, and compliance with ALs and AQLs at the POCs. The Report shall include:

1. A graphical representation of the volumes extracted and injected used to maintain hydraulic control. In the event that more solution was injected than recovered for a 24-hour period, or in the event that any of the instruments used to measure the flow volumes malfunction or are out of service for more than 24 consecutive hours, the permittee shall submit a report showing for each day of the quarterly reporting period, the hydraulic gradient was maintained.
2. A graphical representation that a continuous inward hydraulic gradient was maintained using water level elevations in the ISCR well field. The reports shall include a graphical presentation of head comparisons for each well triplet (observation, recovery/perimeter and POC wells) used to monitor the hydraulic gradient. The report shall also include a figure showing the location and identity of each of the wells. In the event any one of the well triplets indicate less than 1-foot differential, or in the event that any of the instruments used to measure the hydraulic gradient malfunction or are out of service for more than 24 consecutive hours, the permittee shall submit a report showing for each day of the quarterly reporting period, the daily flow into and out of the ISCR well field.
3. Provide the three monthly potentiometric surface maps and provide a description of the cone of depression for the quarter.
4. A summary of annular conductivity device readings at each injection, recovery, perimeter and observation well for both well integrity and formation testing.
5. A summary of pressure transducers readings and fracture gradients readings.
6. A graphical representation of fluid electric conductivity readings from the injection and observation wells, including a graphical plot showing fluid EC at each observation well for the previous 8 quarters.
7. A description of any deviations from standard sampling protocols during the reporting period.
8. A summary of all exceedances of ALs, AQLs, Action Levels, DLs, or operational limits that occurred during the reporting period and all contingency actions completed to mitigate the effects of a violation, or to eliminate the recurrence of an exceedance or violation. The Report shall also include identification and discussion of any laboratory results that fell outside of the laboratory QA/QC criteria and AQLs and ALs required by this permit.
9. Graphical time versus concentration plots of groundwater elevations, field pH, sulfate, and total dissolved solids since the inception of monitoring at each POC well, and any parameter which exceeded an applicable AL or AQL in the past three sampling events at each POC well.
10. Groundwater elevation contour maps for each quarterly monitoring period, including the groundwater elevation obtained from the underground workings.
11. Fissure inspection summary for the reporting period.
12. An updated table of all monitor wells in the Discharge Impact Area including, but not limited to, location of well, depth of well, depth to water, and water level elevation.

13. A summary of any groundwater monitor wells replaced in the reporting period including, but not limited to, location of well, depth of well, depth to water, water level elevation, and screened interval.
14. Groundwater sampling results for the POCs.
15. Copies of reports submitted to the EPA as required by the UIC permit, including groundwater monitoring results from wells not covered by this permit.
16. A report that describes the status of each resource block including whether they are planned, under construction, constructed, operational, rinsing, or closed. Include details for the design of planned wells, a plan view layout of planned wells, and identify Rinse Verification Wells within closed resource blocks proposed for continued monitored.

2.7.4.2.2. Well Abandonment Report

If wells associated with this permit are abandoned due to poor performance, casing collapse, or other reasons, or are abandoned at the end of the post-closure period, the permittee shall submit a well abandonment report to Groundwater Protection Value Stream. Wells abandoned during the reporting period or anticipated to be abandoned shall be submitted as part of a Quarterly Report per Section 3.0, Compliance Schedule. Appropriate contents of the report shall be sealed by an Arizona professional geologist or professional engineer, in accordance with Arizona Board of Technical Registration requirements. Well abandonment records shall include:

1. Copies of ADWR Notice of Intent to Abandon
2. Copies of ADWR Abandonment Reports
3. A description of the methods used to seal the well casing and the perforated or screened interval of the well; and
4. Coordinates of the abandoned well location (Lat/Long) to the nearest 0.01 feet.

2.7.4.3. ISCR Resource Block Pre-operational Report

The permittee shall submit a pre-operational report prior to injecting lixiviant into a resource block per Section 3.0, Compliance Schedule. The following components shall be included:

1. The results obtained from an aquifer pump test for each new resource block. The report shall include, at a minimum: potentiometric groundwater contour maps and evaluation of the potentiometric contour maps for cone of depression as required in Section 2.2.3(3).
2. Underground workings ambient discharge characterization for the first resource block to enter production that is adjacent to or intersecting the underground workings as required in Section 2.5.1.
3. Results of ambient groundwater sampling required by Section 2.2.3 in order to establish resource block closure rinsing requirements identified Section 2.9.1.
4. Results of baseline well bore electrical conductivity measurements from the annular conductivity devices within each resource block, adjacent resource blocks if used to calculate alert levels, and proposed alert level for each resource block with description of how the alert level was calculated.
5. A description of the borehole and well abandonment within 500 feet of the ISCR well area as required in Section 2.2.3, to include details as described in Section 2.7.4.5.3.
6. Well installation details for all injection, recovery, observation, perimeter and POC wells installed during the reporting period in accordance with A.A.C. R12-15-801 et seq. and consist of the following:
    a. Copies of ADWR Notice of Intent (NOI) and all related submittals to ADWR;
    b. Copies of notice of completion of well construction to EPA;
    c. Boring log and well as-built diagram to include depths to key formation tops and screened interval depths;
    d. Materials used such as tubing tally, cement, and other volumes;
    e. Total depth of well measured after installation;
    f. Top of well casing or sounding tube (whichever is used as the fixed reference measuring point) and ground surface elevation;
    g. Depth to static groundwater;
    h. Geophysical logging reports and subsurface sampling results, if any;
    i. Description of well drilling method;
    j. Description of well development method;
    k. If dedicated sampling equipment installed, details on the equipment and at what depth the equipment was installed;
    l. Summary of analytical results for initial groundwater sample collected after installation;
    m. Corresponding analytical data sheets;
    n. Coordinates for location (X, Y, Z) to nearest 0.01 feet for each new well; and,
    o. Any deviations from original proposed construction or location.

2.7.4.4. Point of Compliance Well Ambient Groundwater Quality Report

The permittee shall submit an ambient groundwater quality report of the data and calculations required in Section 2.5.3 and Section 3.0 Compliance Schedule.

The report shall include copies of all laboratory analytical reports, field notes, the QA/QC limits used in collection and analysis of the samples and the statistical calculations of ALs and AQLs for the POC wells.

2.7.4.5. PTF Well Field Rinsing Demonstration Report

The permittee shall submit a report that documents rinsing demonstration activities, data collection and analysis, and that demonstrates that the PTF Well Field has been rinsed sufficiently to meet the Rinsing Demonstration requirements of Section 2.2.5.

The report shall include copies of all laboratory analytical reports, field notes, the QA/QC limits used in collection and analysis of groundwater samples, analysis of the geochemical conditions and description of measures to be taken to reduce rebound, if necessary, during future rinsing of the commercial ISCR wells before closure. Analysis of the geochemical conditions will include geochemical modeling of the long-term equilibrium of the residual solid phase mineral constituents. The report shall be signed and sealed by an Arizona registered professional.

The PTF Well Field Rinsing Demonstration Report shall be submitted and approved by ADEQ prior to re-commencing injection at the PTF well field and prior to injection in the first ISCR resource block as required by the Compliance Schedule, permit Section 3.0.

2.7.5. Reporting Location

All Self-Monitoring Report Forms (SMRFs) shall be submitted through the myDEQ portal accessible on the ADEQ website at: http://www.azdeq.gov/welcome-mydeq

All other documents required by this permit shall be mailed to:

The Arizona Department of Environmental Quality
Groundwater Protection Value Stream
Mail Code 5415B-3
1110 West Washington Street
Phoenix, Arizona 85007
Phone (602) 771-4571

2.7.6. Reporting Deadline

The following table lists the quarterly report due dates:

Table 3:QUARTERLY REPORTING DEADLINES	
Monitoring Conducted During Quarter:	**Quarterly Report Due By:**
January-March	April 30
April-June	July 30
July-September	October 30
October-December	January 30

The following table lists the semi-annual and annual report due dates if applicable:

Table 4: (SEMI-)ANNUAL REPORTING DEADLINES	
Monitoring Conducted:	**Report Due By:**
Semi-annual: January-June	July 30
Semi-annual: July-December	January 30
Annual: January-December	January 30

2.7.7. Changes To Facility Information In Section 1.0

The Groundwater Protection Value Stream shall be notified within ten days of any change of facility information including Facility Name, Permittee Name, Mailing or Street Address, Facility Contact Person, or Emergency Telephone Number.

2.8. Temporary Cessation

[A.R.S. § 49-243(K)(8) and A.A.C. R18-9-A209(A)]

The permittee shall give written notice to the Groundwater Protection Value Stream before ceasing operation of the facility for a period of 60 days or greater. The permittee shall take the following measures upon temporary cessation:

1. Immediately cease injection of lixiviant;
2. Maintain hydraulic control within the resource blocks; and,
3. Continue monitoring as required by the permit.
4. Submittal of Self-Monitoring Report Forms (SMRFs) is still required; report “temporary cessation” in the comment section.

At the time of notification the permittee shall submit for ADEQ approval a plan for maintenance of discharge control systems and for monitoring during the period of temporary cessation. Immediately following ADEQ approval, the permittee shall implement the approved plan. If necessary, ADEQ shall amend permit conditions to incorporate conditions to address temporary cessation. During the period of temporary cessation, the permittee shall provide written notice to the Groundwater Protection Value Stream of the operational status of the facility every three years. If the permittee intends to permanently cease operation of any facility, the permittee shall submit closure notification, as set forth in Section 2.9 below.

2.9. Closure

[A.R.S. §§ 49-243(K)(6), 49-252 and A.A.C. R18-9-A209(B)]

For a facility addressed under this permit, the permittee shall give written notice of closure to the Groundwater Protection Value Stream of the intent to cease operation without resuming activity for which the facility was designed or operated. Submittal of SMRFs is still required; report “closure in process” in the comment section.

2.9.1. Closure Plan

Within 90 days following notification of closure, the permittee shall submit for approval to the Groundwater Protection Value Stream, a closure plan which meets the requirements of A.R.S. § 49-252 and A.A.C. R18-9-A209(B)(3). The plan shall include the following specific activities

2.9.1.1. Rinsing

1. Rinsing shall begin within each resource block within 6 months of the wells being taken out of service. Rinsing shall consist of injecting formation water and neutralization agents. At all times during initial resource block rinsing, the permittee will maintain hydraulic control by sustaining an inward hydraulic gradient within the resource block. The permittee will monitor the rinsing progress by analyzing the water recovered from well-field headers for sulfate concentration. When levels of sulfate in the headers have reached approximately 750 parts per million (ppm), the permittee will sample the well header discharges for constituents listed in Section 4.2 Table 14: ANNUAL GROUNDWATER MONITORING. If the results of the sampling show concentrations of parameters greater than the AWQS and or greater than the pre-determined mine block concentrations, then rinsing operations will continue until all compounds are below AWQSs or predetermined mine block concentrations.
2. The permittee will sample all of the wells in the resource block undergoing closure to determine if the sulfate concentrations are less than 750 ppm and the pH is above 5.0 S.U. The permittee will continue rinsing each well until such time that the sulfate concentration in the well is less than 750 ppm and the pH is above 5.0 S.U.
3. When all individual well sulfate concentrations in the mine block are less than 750 ppm and the pH is above 5.0 S.U., hydraulic control will be discontinued and the resource block allowed to rest for 30 days. At the end of the 30-day rest period, the wells will be re-sampled and if sulfate concentrations remain below 750 ppm and pH remains above 5.0 S.U. and Table 14: ANNUAL GROUNDWATER MONITORING parameters remain below AQLs, the permittee may cease rinsing within the resource block. If any samples exceed rinse verification standards, the rinsing sequence shall be continued and additional water quality samples shall be collected until standards are met.
4. Confirmation monitoring of groundwater from the resource block after rinsing shall be conducted to evaluate the effectiveness of the rinsing and measure any rebound effects to mine block contaminants. Samples shall be collected from wells within the mining block designated as rinse verification wells (RVWs). Permittee shall select the RVWs based on their spatial, geological, hydrogeological, and geochemical representativeness. Samples from these wells shall be analyzed by laboratory methods for constituents listed in Section 4.2, Table 14: ANNUAL GROUNDWATER MONITORING at one month, six months and one year increments after groundwater rinsing has ceased. If analyses indicate that rinse verification standards are not achieved in the resource block, rinsing and/or resting shall resume.
5. When rinse verification standards are achieved in the RVWs, the remaining (non-RVW) wells in the resource block shall be plugged and abandoned, leaving only the RVWs open. The RVWs shall remain open and available throughout the mine life to assist with closure verification and post rinse remediation if required.

If the closure plan achieves clean-closure immediately, ADEQ shall issue a letter of approval to the permittee. If the closure plan contains a schedule for bringing the facility to a clean-closure configuration at a future date, ADEQ may incorporate any part of the schedule as an amendment to this permit.

2.9.2. Closure Completion

Upon completion of closure activities, the permittee shall give written notice to the Groundwater Protection Value Stream indicating that the approved closure plan has been implemented fully and providing supporting documentation to demonstrate that clean-closure has been achieved (soil sample results, verification sampling results, groundwater data, as applicable). If clean-closure has been achieved, ADEQ shall issue a letter of approval to the permittee at that time. If any of the following conditions apply, the permittee shall follow the terms of post-closure stated in this permit:

1. Clean-closure cannot be achieved at the time of closure notification or within one year thereafter under a diligent schedule of closure actions;
2. Further action is necessary to keep the facility in compliance with the AWQS at the applicable POC or, for any pollutant for which the AWQS was exceeded at the time this permit was issued, further action is necessary to prevent the facility from further degrading the aquifer at the applicable POC with respect to that pollutant;
3. Remedial, mitigative or corrective actions or controls are necessary to comply with A.R.S. § 49-201(30) and Title 49, Chapter 2, Article 3;
4. Further action is necessary to meet property use restrictions.
5. SMRF submittals are still required until Clean Closure is issued.

2.10. Post-closure

[A.R.S. §§ 49-243(K)(6), 49-252 and A.A.C. R18-9 A209(C)]

Post-closure requirements shall be established based on a review of facility closure actions and will be subject to review and approval by the Groundwater Protection Value Stream.

In the event clean-closure cannot be achieved pursuant to A.R.S. § 49-252, the permittee shall submit for approval to the Groundwater Protection Value Stream a post-closure plan that addresses post-closure maintenance and monitoring actions at the facility. The post-closure plan shall meet all requirements of A.R.S. §§ 49-201(30) and 49-252 and A.A.C. R18-9-A209(C). Upon approval of the post-closure plan, this permit shall be amended or a new permit shall be issued to incorporate all post-closure controls and monitoring activities of the post-closure plan.

2.10.1. Post-Closure Plan

A specific post-closure plan may be required upon the review of the closure plan.

2.10.2. Post-Closure Completion

Not required at the time of permit issuance.

3.0 COMPLIANCE SCHEDULE

[A.R.S. § 49-243(K)(5) and A.A.C. R18-9-A208]

Unless otherwise indicated, for each compliance schedule item listed in Table 5: COMPLIANCE SCHEDULE ITEMS, the permittee shall submit the required information to the Groundwater Protection Value Stream.

Table 5: COMPLIANCE SCHEDULE ITEMS			
No.	**Description**	**Due By:**	**Permit Amendment Required?**
1	The permittee shall submit a demonstration that the financial assurance mechanism listed in Section 2.1, Financial Capability, is being maintained as per A.R.S. 49-243.N.4 and A.A.C. R18-9-A203(H) for all estimated closure and post-closure costs including updated costs submitted under Section 3.0, No. 2 below. The demonstration shall include a statement that the closure and post-closure strategy has not changed, the discharging facilities listed in the permit have not been altered in a manner that would affect the closure and post-closure costs, and discharging facilities have not been added. NOTE: An updated financial assurance mechanism may be provided following ADEQ's approval of the closure and post-closure costs (CSI No. 2) due on the same date. When submitting the closure and post-closure costs, permittee may provide a statement for the type of mechanism intended to be provided.	May 1, 2026 and every six (6) years thereafter for the duration of the permit.	No
2	The permittee shall submit updated cost estimates for facility closure and post-closure, as per A.A.C. R18-9-A201(B)(5) and A.R.S. 49-243.N.2.a.	May 1, 2026, and every six (6) years thereafter, for the duration of the permit	Yes (Other)
3	The permittee shall submit documentation for the financial assurance mechanism provided to the U.S. EPA for the Underground Injection Control (UIC) permit for this facility.	Prior to discharge to the ISCR wells.	No
4	The permittee shall submit a PTF Well Field Rinsing Demonstration Report as described in Section 2.7.4.5 Injection at the PTF Well Field shall not re-commence until the amended permit is issued.	No later than 45 days prior to re-starting injection and recovering in the PTF Well Field	Yes (Other)

Table 5: COMPLIANCE SCHEDULE ITEMS			
5	The permittee shall submit an amendment application for ADEQ review and approval to include the following: • Pre-Operational Report for the ISCR resource block, per Section 2.7.4.3 • Proposed well bore electrical conductivity alert levels for the ISCR resource block • List of all ISCR and PTF Well Field injection, recovery and perimeter wells that are: o undergoing rinsing o have completed rinsing and are proposed to be abandoned; o are proposed as Rinse Verification Wells (RVWs) to remain open after rinsing to facilitate post-closure monitoring. • For the first ISCR resource block constructed under this permit, the application shall also include the PTF Well Field Rinsing Demonstration Report, per Section 2.7.4.5 • For the ISCR resource block to be constructed in the vicinity of POC wells, M54-LBF and M54-O, the application shall also include the well abandonment reports for the wells and a request to remove these POC wells from the permit. The amendment application may refer to information previously provided in a Quarterly Report. Injection into the ISCR resource block shall not commence until the amended permit is issued.	No later than 90 days prior to operation of each ISCR resource block	Yes (Other)
6	The permittee shall submit Quarterly Reports as described in permit Section 2.7.4.2	No later than 30 days following the end of each calendar quarter	No
7	The permittee shall submit Annual Reports as described in permit Section 2.7.4.1	January 30 of the following year	No
8	The permittee shall conduct ambient groundwater monitoring per section 2.5.3.2 and submit a Point of Compliance Well ambient groundwater monitoring report per Section 2.7.4.6 as a permit amendment to set ALs and AQLs for replacement POC wells M32-UBF (replacement) and M33-UBF (replacement).	Within 30 days of receipt of the laboratory analytical analysis of the final ambient sampling round	Yes (Other)
9	The permittee shall submit a report for the BHP Copper Evaporation Pond that documents the condition of the pond, any inspections and repairs completed, and any recommendations for using the pond for storage of process solutions from the ISCR operation. The report shall be prepared, signed and sealed by an Arizona registered professional engineer.	60 days prior to bringing the pond into service	No
10	The permittee shall submit a construction report along with sealed as-built drawings and QA/QC documentation for the PLS Pond to confirm that the facility was constructed in accordance with the design report, engineering plans and specifications.	Within 60 days of completion of construction.	No
11	The permittee shall submit a construction report along with sealed as-built drawings and QA/QC documentation for the Raffinate Pond to confirm that the facility was constructed in accordance with the design report, engineering plans and specifications.	Within 60 days of completion of construction.	No

Table 5: COMPLIANCE SCHEDULE ITEMS			
12	The permittee shall submit a construction report along with sealed as-built drawings and QA/QC documentation for the Runoff Pond to confirm that the facility was constructed in accordance with the design report, engineering plans and specifications.	Within 60 days of completion of construction.	No
13	The permittee shall submit a construction report along with sealed as-built drawings and QA/QC documentation for Water Impoundment 1 to confirm that the facility was constructed in accordance with the design report, engineering plans and specifications.	Within 60 days of completion of construction.	No
14	The permittee shall submit a construction report along with sealed as-built drawings and QA/QC documentation for Water Impoundment 2 to confirm that the facility was constructed in accordance with the design report, engineering plans and specifications.	Within 60 days of completion of construction.	No
15	The permittee shall submit a construction report along with sealed as-built drawings and QA/QC documentation for Water Impoundment 3 to confirm that the facility was constructed in accordance with the design report, engineering plans and specifications.	Within 60 days of completion of construction.	No
16	The permittee shall submit a construction report along with sealed as-built drawings and QA/QC documentation for Water Impoundment 4 to confirm that the facility was constructed in accordance with the design report, engineering plans and specifications.	Within 60 days of completion of construction.	No
17	The permittee shall submit a construction report along with sealed as-built drawings and QA/QC documentation for Water Impoundment 5 to confirm that the facility was constructed in accordance with the design report, engineering plans and specifications.	Within 60 days of completion of construction.	No
18	The permittee shall submit the results of sampling and analysis for discharge characterization per Table 7: ONE-TIME SAMPLING EVENT - DISCHARGE MONITORING LOCATIONS and Table 9: DISCHARGE MONITORING SAMPLING PARAMETERS for the PLS Pond.	Within 90 days of discharge to the pond	No
19	The permittee shall submit the results of sampling and analysis for discharge characterization per Table 7: ONE-TIME SAMPLING EVENT - DISCHARGE MONITORING LOCATIONS and Table 9: DISCHARGE MONITORING SAMPLING PARAMETERS for the Raffinate Pond.	Within 90 days of discharge to the pond	No
20	The permittee shall submit the results of sampling and analysis for discharge characterization per Table 7: ONE-TIME SAMPLING EVENT - DISCHARGE MONITORING LOCATIONS and Table 9: DISCHARGE MONITORING SAMPLING PARAMETERS for the Runoff Pond.	Within 90 days of discharge to the pond	No
21	The permittee shall submit the results of sampling and analysis for discharge characterization per Table 7: ONE-TIME SAMPLING EVENT - DISCHARGE MONITORING LOCATIONS and Table 9: DISCHARGE MONITORING SAMPLING PARAMETERS for Water Impoundment 1.	Within 90 days of discharge to the pond	No
22	The permittee shall submit the results of sampling and analysis for discharge characterization per Table 7: ONE-TIME SAMPLING EVENT - DISCHARGE MONITORING LOCATIONS and Table 9: DISCHARGE MONITORING SAMPLING PARAMETERS for Water Impoundment 2.	Within 90 days of discharge to the pond	No
23	The permittee shall submit the results of sampling and analysis for discharge characterization per Table 7: ONE-TIME SAMPLING EVENT - DISCHARGE MONITORING LOCATIONS and Table 9: DISCHARGE MONITORING SAMPLING PARAMETERS for Water Impoundment 3.	Within 90 days of discharge to the pond	No

Table 5: COMPLIANCE SCHEDULE ITEMS			
24	The permittee shall submit the results of sampling and analysis for discharge characterization per Table 7: ONE-TIME SAMPLING EVENT - DISCHARGE MONITORING LOCATIONS and Table 9: DISCHARGE MONITORING SAMPLING PARAMETERS for Water Impoundment 4.	Within 90 days of discharge to the pond	No
25	The permittee shall submit the results of sampling and analysis for discharge characterization per Table 7: ONE-TIME SAMPLING EVENT - DISCHARGE MONITORING LOCATIONS and Table 9: DISCHARGE MONITORING SAMPLING PARAMETERS for Water Impoundment 5.	Within 90 days of discharge to the pond	No

4.0 TABLES OF MONITORING REQUIREMENTS

4.1. PRE-OPERATIONAL MONITORING (OR CONSTRUCTION REQUIREMENTS)

Not applicable.

4.2. COMPLIANCE OR OPERATIONAL MONITORING

Table 6: PERMITTED FACILITIES AND BADCT

Facility Name	Facility BADCT
Production Test Facility In-Situ Area Injection and Recovery Well Field	Design, construction, testing (mechanical integrity), and operation of injection and recovery wells shall follow EPA Class III rules (40 CFR Part 146). The maximum fracture pressure shall be no greater than 0.65 pounds per square inch per foot (psi/ft) of depth. Hydraulic control shall be maintained at all times, within the well field, by pumping recovery wells at a rate greater than the injection rate in order to maintain a cone of depression that extends at least 500 feet from the in-situ area injection and recovery well field. The injection and extraction volumes shall be metered at the well-heads, monitored daily, and recorded. All boreholes or wells, other than those approved for the well field, located within 500-feet of the well field boundary have been plugged and abandoned per the Arizona Department of Water Resources (ADWR) rules and EPA Underground Injection Control (UIC) regulations prior to well field operation. During closure of the well field all operational wells shall be plugged and abandoned per the above regulations.
Production Test Facility Process Water Impoundment (PWI)	The PWI will have a capacity of approximately 1.7 million cubic feet, approximately 15 to 23-feet deep, with internal and external side slopes of 2.5-feet horizontal to 1.0-feet vertical (2.5H:1V)), and maintain a minimum of two (2) feet freeboard. The PWI is designed as a double liner system and includes a leak collection and removal system (LCRS). The liner system consists of, from bottom to top: a compacted sub-grade (foundation) with liner bedding, 60-mil HDPE secondary liner, geonet, and 60-mil primary liner. The LCRS will be equipped with a sump located at the lowest elevation of the pond, a sump pump to remove accumulated liquids, and an alarm system for fluid detection.
Production Test Facility Run-off Pond	The Runoff Pond will have a capacity of approximately 6,583 cubic feet; the pond depth will be approximately 5-feet deep but will vary; internal and external side slopes will be no less than 2.0-feet horizontal to 1.0-feet vertical (2.5H:1V); and pond shall maintain two (2) feet of freeboard. The Runoff Pond is designed with a single liner that includes an engineered compacted sub-grade and 60-mil HDPE geomembrane liner. The Runoff Pond will incorporate a sump with pump along with fluid-level detection equipment. When fluid is detected above the level set-point the pump will transfer fluid out of the Runoff Pond to the Water Impoundment via pipeline.
BHP Copper In-Situ Area Injection and Recovery Well Field	The BHP Copper UIC Class III injection wells will not be operated as part of the ISCR operation. The BHP wells will be abandoned in accordance with the UIC and ADWR requirements once approved by ADEQ and EPA.
BHP Copper Evaporation Pond	The BHP Copper Evaporation Pond is sized to contain direct precipitation from the 100-year, 24-hour storm event and shall maintain a minimum of two (2) feet freeboard. The Pond is designed with a double liner system and includes a leak collection and removal system (LCRS). The liner system consists of, from bottom to top: a compacted sub-grade, 60-mil HDPE secondary liner, 200- mil thick geonet, and 60-mil primary liner. The LCRS will be equipped with a sump located at the lowest elevation of the pond and a sump pump to remove liquids. An inspection shall be performed and any necessary repair completed prior to bringing the pond into service, per the Compliance Schedule requirements.
In-Situ Copper Recover (ISCR) Area Injection and Recovery Resource Blocks	Design, construction, testing (mechanical integrity), and operation of injection and recovery wells shall follow EPA Class III rules (40 CFR Part 146). The maximum fracture pressure shall be no greater than 0.65 pounds per square inch per foot (psi/ft) of depth. Hydraulic control shall be maintained at all times, within the resource block, by pumping recovery wells at a rate greater than the injection rate in order to maintain a cone of depression that extends at least 500 feet from the active in-situ wellfield area . The "active" area includes the resource blocks where the wells have been used for injection and recovery, from the time injection begins, through the rinsing phase and up to the time the wells are abandoned. Active areas do not include the resource blocks that have completed rinsing and the only remaining wells are the verification wells. The injection and extraction volumes shall be metered at the well-heads, monitored daily, and recorded. All boreholes or wells, other than those approved for the resource block, located within 500-feet of the well field boundary shall be plugged and abandoned per the Arizona Department of Water Resources (ADWR) rules and EPA Underground Injection Control (UIC) regulations prior to resource block operation. During closure of the resource block all operational wells shall be plugged and abandoned per the above regulations.
PLS Pond	The PLS Pond is sized to contain direct precipitation from the 100-year, 24-hour storm event, 8 hours of process solution pumping at the full design flow of 11,000 gpm, and shall maintain a minimum of 2- feet freeboard. The PLS Pond is designed as a double liner system and includes a LCRS. The liner system consists of, from bottom to top: a compacted sub-grade, 60-mil HDPE secondary liner, geonet, and 60-mil primary liner. The LCRS will be equipped with a sump located at the lowest elevation of the pond and a sump pump to remove liquids.

Table 6: PERMITTED FACILITIES AND BADCT	
Raffinate Pond	The Raffinate Pond is sized to contain direct precipitation from the 100-year, 24-hour storm event,8 hours of process solution pumping at the nominal operating flow limit of 11,000 gpm, and shall maintain a minimum of 2 feet freeboard. The Raffinate Pond is designed as a double liner system and includes a LCRS. The liner system consists of, from bottom to top: a compacted sub-grade, 60-mil HDPE secondary liner, geonet, and 60-mil primary liner. The LCRS will be equipped with a sump located at the lowest elevation of the pond and a sump pump to remove liquids.
Runoff Pond	The Runoff Pond is sized to contain direct precipitation from the 100-year, 24-hour storm event, and runoff from process facilities estimated as 250,000 cubic feet and shall maintain two (2) feet of freeboard. The Runoff Pond is designed with a single liner that includes an engineered compacted sub-grade and 60-mil HDPE geomembrane liner. Fluid will be returned to process or transferred to the Water Impoundments via pumps and piping.
Water Impoundment 1	The Water Impoundments are sized to contain direct precipitation from the 100-year, 24-hour storm event, the maximum operational seasonal volume of process solution as predicted by the water balance, anticipated precipitate volume, and shall maintain a minimum of two (2) feet freeboard. The Ponds are designed with a double liner system and includes a leak collection and removal system (LCRS). The liner system consists of, from bottom to top: a compacted sub-grade, 60-mil HDPE secondary liner, geonet, and 60-mil primary liner. The LCRS will be equipped with a sump located at the lowest elevation of the pond and a sump pump to remove liquids.
Water Impoundment 2	
Water Impoundment 3	
Water Impoundment 4	
Water Impoundment 5	

Table 7: ONE-TIME SAMPLING EVENT - DISCHARGE MONITORING LOCATIONS		
Facility	**Latitude**	**Longitude**
PLS Pond	33° 03' 4.26"	111° 25' 19.50"
Raffinate Pond	33° 03' 4.05"	111° 25' 19.68"
Runoff Pond	33° 03' 4.66"	111° 25' 22.6"
BHP Copper Evaporation Pond		
Water Impoundment 1	To be determined	To be determined
Water Impoundment 2	To be determined	To be determined
Water Impoundment 3	To be determined	To be determined
Water Impoundment 4	To be determined	To be determined
Water Impoundment 5	To be determined	To be determined

Table 8: MULTIPLE SAMPLING EVENT - DISCHARGE MONITORING LOCATION		
Facility	**Latitude**	**Longitude**
Underground workings – Main Shaft	33° 03' 4.13"	111° 25' 45.07"

Table 9: DISCHARGE MONITORING SAMPLING PARAMETERS **(in mg/L unless otherwise noted)**[2]		
pH – field & lab (SU)	Sodium	Nickel
Specific Conductance - field and lab (µmhos/cm)	Iron	Selenium
Total Dissolved Solids	Aluminum	Thallium
Total Alkalinity	Antimony	Zinc
Carbonate	Arsenic	Gross Alpha Particle Activity (pCi/L)[3]
Bicarbonate	Barium	Radium 226 + Radium 228 (pCi/L)
Nitrate	Beryllium	Uranium-Isotopes (pCi/L)[4]
Sulfate	Cadmium	Total Petroleum Hydrocarbons
Chloride	Chromium	Benzene
Fluoride	Cobalt	Toluene
Calcium	Copper	Ethylbenzene
Ammonia	Lead	Total Xylenes
Magnesium	Manganese	Uranium, Total (µg/L)
Potassium	Mercury	

[2] Metals shall be analyzed as dissolved metals.

[3] Adjusted gross alpha is calculated if gross alpha is greater than 12 picocuries per liter, otherwise gross alpha is used. The adjusted gross alpha particle activity is the gross alpha particle activity, including radium 226, and any other alpha emitters, if present in the water sample, minus radon and total uranium (the sum of uranium 238, uranium 235 and uranium 234 isotopes). The gross alpha analytical procedure (evaporation technique: EPA Method 900.0) drives off radon gas in the water samples. Therefore, the Adjusted Gross Alpha should be calculated using the following formula: (Laboratory Reported Gross Alpha MINUS Total Uranium Isotopes).

[4] Total Uranium Isotope activity results must be used for calculating Adjusted Gross Alpha.No SMRF reporting is required.

Table 10: REQUIRED INSPECTIONS AND OPERATIONAL MONITORING			
Facility Category	**Facility Names**	**Operational Requirements**	**Inspection Frequency**
Process Solution Impoundments	PTF Process Water Impoundment PLS Pond Raffinate Pond BHP Copper Evaporation Pond Water Impoundments 1 through 5	-Maintain 2 feet of freeboard; -all discharge and sump pumps operational -no substantial erosion subsidence, cracking, -no evidence of seepage or other damage to berms -no visible cracks or damage to liner -full access to leak detection system maintained -no vegetation present in the impoundment or within five feet of the impoundment	Daily
Lined Non-stormwater Containment Pond	PTF Run-off Pond Run-off Pond	-Maintain 2 feet of freeboard -spillway clear of sediment or obstructions -no visible cracking or damage to liner -no operational damage to enclosure wall -all pumps operational -backup power supply operational -no ponding of spilled material in pond and sumps -sediment deeper than 1 inch deep removed from sumps -fluids in sumps maintained at less than pump-down levels -no vegetation present in the pond or within five feet of the pond	Weekly
Storm water control structures	Site-wide stormwater ditches	-No substantial erosion or structural damage -maintained free of sediments, vegetation or obstructions.	Monthly
Groundwater Monitoring Wells	Site-wide monitoring wells	-Wellhead cap or box locks are observed to be secure -well pad, cap and seals are intact -no discernable corrosion or deterioration of the well -no discernable materials accumulating in the well -any dedicated well equipment are functional and intact	Quarterly, as sampled
Pumps	Barge Pumps Run-Off Transfer Pumps Sump Pumps Discharge Pumps	-Visual inspection for leaks -Lubrication -Maintenance and test run	-Weekly -As per manufacturers specification -Every 1,000 to 1,200 hours of operation
In-Situ Area Injection and Recovery Resource Blocks	PTF Well Field ISCR Area	No leakage from pipelines, manifolds or well heads.	Daily
In-Situ Area Injection and Recovery Resource Blocks	PTF Well Field ISCR Area	No evidence of subsidence/fissures	Quarterly

Table 11: LEAK COLLECTION AND REMOVAL SYSTEM MONITORING[5]				
Facility Name	**Alert Level 1 (GPD)6**	**Alert Level 2 (GPD)**	**Monitoring Method**	**Monitoring Frequency**
PTF Process Water Impoundment	2,040	16,250	Automated	Daily
PLS Pond	1,440	28,800	Automated	Daily
Raffinate Pond	1,440	28,800	Automated	Daily
BHP Copper Evaporation Pond	5,760	141,120	Automated	Daily
Water Impoundment 1	15,840	466,560	Automated	Daily
Water Impoundment 2	12,960	407,520	Automated	Daily
Water Impoundment 3	17,280	512,640	Automated	Daily
Water Impoundment 4	14,400	437,760	Automated	Daily
Water Impoundment 5	18,720	561,600	Automated	Daily

Table 12: PARAMETERS FOR AMBIENT GROUNDWATER MONITORING (in mg/L unless otherwise noted)[7]		
Depth to Water Level (feet)	Magnesium	Molybdenmum
Water Level Elevation (feet amsl)	Potassium	Nickel
Temperature- field (ºF)	Sodium	Selenium
pH – field & lab (SU)	Iron	Thallium
Specific Conductance- field & lab (µmhos/cm)	Aluminum	Zinc
Total Dissolved Solids	Antimony	Intentionally left blank
Total Alkalinity	Arsenic	Adjusted Gross Alpha (pCi/L)[8]
Bicarbonate	Barium	Radium 226 (pCi/L)
Carbonate	Beryllium	Radium 228 (pCi/L)
Hydroxide	Cadmium	Uranium-Isotopes(pCi/L)[9]
Sulfate	Chromium	Uranium, Total (µg/L)
Chloride	Cobalt	Benzene
Fluoride	Copper	Toluene
Nitrate	Lead	Ethylbenzene
Nitrite	Manganese	Total Xylenes
Calcium	Mercury	

[5] The volume of liquid pumped from the LCRS shall be entered in a facility log book on a daily basis. The Alert Level 1 (AL1) or Alert Level 2 (AL2) shall be exceeded when the amount of leakage pumped from the sump for the pond is greater than the applicable quantity below. Contingency requirements of Sections 2.6.2.2 and 2.6.2.3 shall be followed for AL1 and AL2 exceedances, respectively. An exceedance of AL 1 or AL2 is not a violation of the permit unless the permittee fails to perform actions as required under the Sections referenced above

[6] GPD = gallons per day

[7] Metals must be analyzed as dissolved metals.

[8] The adjusted gross alpha particle activity is the gross alpha particle activity, including radium 226, and any other alpha emitters, if present in the water sample, minus radon and total uranium (the sum of uranium 238, uranium 235 and uranium 234 isotopes). The gross alpha analytical procedure (evaporation technique: EPA Method 900.0) drives off radon gas in the water samples. Therefore, the Adjusted Gross Alpha should be calculated using the following formula: (Laboratory Reported Gross Alpha MINUS Sum of the Uranium Isotopes).

[9] Uranium Isotope activity results must be used for calculating Adjusted Gross Alpha. No SMRF reporting is required.

Table 13: QUARTERLY GROUNDWATER COMPLIANCE MONITORING								
Parameter	**M1-GL**		**M2-GU**		**M3-GL**		**M4-0**	
	AQL (mg/l)	**AL (mg/l)**	**AQL (mg/l)**	**AL (mg/l)**	**AQL (mg/l)**	**AL (mg/l)**	**AQL (mg/l)**	**AL (mg/l)**
Depth to Groundwater (ft. bgs)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Water Level Elevation (ft amsl)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Indicator Parameters[10]:								
pH (field) (S.U.)	Monitor[11]	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Specific Conductance (field) (mhos/cm)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Temperature (field)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Fluoride	4.0	3.2	4.0	3.2	4.0	3.2	5.1	Monitor
Magnesium	NE[12]	31	NE	39	NE	36	NE	15
Sulfate	NE	184.2	NE	275	NE	187	NE	405
Total dissolved solids	NE	1028	NE	1496	NE	1157	NE	1072

TABLE 13: QUARTERLY GROUNDWATER COMPLIANCE MONITORING (CONTINUED)								
Parameter	**M6-GU**		**M7-GL**		**M8-O**		**M14-GL**	
	AQL (mg/l)	**AL (mg/l)**	**AQL (mg/l)**	**AL (mg/l)**	**AQL (mg/l)**	**AL (mg/l)**	**AQL (mg/l)**	**AL (mg/l)**
Depth to Groundwater (ft. bgs)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Water Level Elevation (ft amsl)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Indicator Parameters:								
pH (field) (S.U.)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Specific Conductance (field) (mhos/cm)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Temperature (field)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Fluoride	4.0	3.2	4.0	3.2	4.0	3.6	4.0	3.2
Magnesium	NE	44	NE	1.0	NE	1.0	NE	23
Sulfate	NE	86	NE	82	NE	122	NE	144
Total dissolved solids	NE	620	NE	464	NE	609	NE	874

[10] Metals must be analyzed as dissolved metals.
[11] Monitor = Monitoring required, but no AQL or AL will be established in the permit.
[12] NE = Not Established

TABLE 13: QUARTERLY GROUNDWATER COMPLIANCE MONITORING (CONTINUED)								
Parameter	**M15-GU**		**M16-GU(R)**		**M17-GL**		**M18-GU**	
	AQL (mg/l)	**AL (mg/l)**	**AQL (mg/l)**	**AL (mg/l)**	**AQL (mg/l)**	**AL (mg/l)**	**AQL (mg/l)**	**AL (mg/l)**
Depth to Groundwater (ft. bgs)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Water Level Elevation (ft amsl)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Indicator Parameters:								
pH (field) (S.U.)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Specific Conductance (field) (mhos/cm)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Temperature (field)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Fluoride	4.0	3.2	4.0	3.2	4.0	3.2	4.0	3.2
Magnesium	NE	44	NE	52	NE	9.3	NE	36
Sulfate	NE	126	NE	248	NE	209	NE	288
Total dissolved solids	NE	1359	NE	1635	NE	831	NE	1323

TABLE 13: QUARTERLY GROUNDWATER COMPLIANCE MONITORING (CONTINUED)								
Parameter	**M19-LBF**		**M20-O (R)**		**M21-UBF**		**M22-0**	
	AQL (mg/l)	**AL (mg/l)**	**AQL (mg/l)**	**AL (mg/l)**	**AQL (mg/l)**	**AL (mg/l)**	**AQL (mg/l)**	**AL (mg/l)**
Depth to Groundwater (ft. bgs)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Water Level Elevation (ft amsl)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Indicator Parameters:								
pH (field) (S.U.)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Specific Conductance (field) (mhos/cm)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Temperature (field)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Fluoride	4.0	3.2	4.0	3.2	4.0	3.2	4.0	3.2
Magnesium	NE	21	NE	14	NE	87	NE	8.6
Sulfate	NE	89	NE	112	NE	487	NE	86
Total dissolved solids	NE	794	NE	809	NE	2867	NE	1094

TABLE 13: QUARTERLY GROUNDWATER COMPLIANCE MONITORING (CONTINUED)								
Parameter	**M23-UBF**		**M24-0**		**M25-UBF**		**M26-0**	
	AQL (mg/l)	**AL (mg/l)**	**AQL (mg/l)**	**AL (mg/l)**	**AQL (mg/l)**	**AL (mg/l)**	**AQL (mg/l)**	**AL (mg/l)**
Depth to Groundwater (ft. bgs)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Water Level Elevation (ft amsl)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Indicator Parameters:								
pH (field) (S.U.)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Specific Conductance (field) (mhos/cm)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Temperature (field)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Fluoride	4.0	3.2	4.0	3.2	4.0	3.2	4.0	3.4
Magnesium	NE	69	NE	19	NE	76	NE	1.0
Sulfate	NE	411	NE	1364	NE	387	NE	105
Total dissolved solids	NE	2392	NE	2363	NE	2683	NE	556

TABLE 13: QUARTERLY GROUNDWATER COMPLIANCE MONITORING (CONTINUED)								
Parameter	**M27-LBF**		**M28-LBF**		**M29-UBF**		**M30-0**	
	AQL (mg/l)	**AL (mg/l)**	**AQL (mg/l)**	**AL (mg/l)**	**AQL (mg/l)**	**AL (mg/l)**	**AQL (mg/l)**	**AL (mg/l)**
Depth to Groundwater (ft. bgs)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Water Level Elevation (ft amsl)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Indicator Parameters:								
pH (field) (S.U.)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Specific Conductance (field) (mhos/cm)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Temperature (field)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Fluoride	4.0	3.2	4.0	3.2	4.0	3.2	4.0	3.2
Magnesium	NE	51	NE	2.6	NE	84	NE	18
Sulfate	NE	179	NE	81	NE	456	NE	102
Total dissolved solids	NE	1745	NE	610	NE	2751	NE	824

TABLE 13: QUARTERLY GROUNDWATER COMPLIANCE MONITORING (CONTINUED)

Parameter	**M31-UBF**		**P19-1-0**		**O19-GL**		**P49-O**	
	AQL (mg/l)	**AL (mg/l)**	**AQL (mg/l)**	**AL (mg/l)**	**AQL (mg/l)**	**AL (mg/l)**	**AQL (mg/l)**	**AL (mg/l)**
Depth to Groundwater (ft. bgs)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Water Level Elevation (ft amsl)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Indicator Parameters:								
pH (field) (S.U.)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Specific Conductance (field) (mhos/cm)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Temperature (field)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Fluoride	4.0	3.2	4.0	3.2	4.0	3.2	4	3.2
Magnesium	NE	NE	NE	23	NE	17	NE	18
Sulfate	NE	330	NE	144	NE	99	NE	181
Total dissolved solids	NE	NE	NE	874	NE	770	NE	849

TABLE 13: QUARTERLY GROUNDWATER COMPLIANCE MONITORING (CONTINUED)

Parameter	**O49-GL(R)**		**M52-UBF (M32-UBF replacement)**		**M54-LBF**		**M54-O**	
	AQL (mg/l)	**AL (mg/l)**	**AQL (mg/l)**	**AL (mg/l)**	**AQL (mg/l)**	**AL (mg/l)**	**AQL (mg/l)**	**AL (mg/l)**
Depth to Groundwater (ft. bgs)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Water Level Elevation (ft amsl)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Indicator Parameters:								
pH (field) (S.U.)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Specific Conductance (field) (mhos/cm)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Temperature (field)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Fluoride	4	3.2	4	3.2	4	3.2	4	3.2
Magnesium	NE	6.2	NE	45	NE	46	NE	11
Sulfate	NE	181	NE	351	NE	329	NE	200
Total dissolved solids	NE	801	NE	1666	NE	1731	NE	855

TABLE 13: QUARTERLY GROUNDWATER COMPLIANCE MONITORING (CONTINUED)		
Parameter	**M33-UBF (replacement)**	
	AQL (mg/l)	**AL (mg/l)**
Depth to Groundwater (ft. bgs)	Monitor	Monitor
Water Level Elevation (ft amsl)	Monitor	Monitor
Indicator Parameters:		
pH (field) (S.U.)	Monitor	Monitor
Specific Conductance (field) (mhos/cm)	Monitor	Monitor
Temperature (field)	Monitor	Monitor
Fluoride	Reserved[13]	Reserved
Magnesium	Reserved	Reserved
Sulfate	Reserved	Reserved
Total dissolved solids	Reserved	Reserved

[13] Reserved – AQL/ALs pending ambient monitoring being performed per Section 2.5.3.2 and the CSI requirements

Table 14: ANNUAL GROUNDWATER MONITORING

Parameter[14]	**M1-GL**		**M2-GU**		**M3-GL**	
	AQL (mg/l)	AL (mg/l)	AQL (mg/l)	AL (mg/l)	AQL (mg/l)	AL (mg/l)
pH (lab)	Monitor[15]	Monitor	Monitor	Monitor	Monitor	Monitor
Bicarbonate	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Calcium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Carbonate	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Chloride	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Nitrate as nitrogen[16]	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Potassium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Sodium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Cation/anion balance	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Aluminum	Monitor	0.71	Monitor	0.71	Monitor	0.71
Antimony	0.006	0.005	0.016	Monitor	0.006	0.005
Arsenic	0.05	0.026	0.05	0.026	0.05	0.026
Barium	2.0	1.6	2.0	1.6	2.0	1.6
Beryllium	0.004	0.0032	0.0053	Monitor	0.0053	Monitor
Cadmium	0.005	Monitor	0.040	Monitor	0.005	Monitor
Chromium (total)	0.10	0.08	0.10	0.08	0.10	0.08
Cobalt	NE[17]	0.005	NE	0.005	NE	0.005
Copper	NE	0.51	NE	0.51	NE	0.51
Iron	NE	2.2	NE	2.2	NE	2.2
Lead	0.05	0.04	0.05	0.04	0.05	0.04
Manganese	NE	0.22	NE	0.22	NE	0.22
Mercury	0.002	0.0016	0.002	0.0016	0.002	0.0016
Nickel	0.13	NE	0.13	NE	0.13	NE
Selenium	0.05	0.04	0.05	0.04	0.05	0.04
Thallium	0.002	0.0016	0.002	0.0016	0.002	0.0016
Zinc	NE	2.5	NE	2.5	NE	2.5
Gross Alpha	NE	15	NE	15	NE	1
Adjusted Gross Alpha (pCi/L)[18]	15	12	15	12	15	12
Radium 226 + 228 (pCi/L)	5	4	5	4	5	4
Total Uranium Isotopes (pCi/L)[19]	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Total Uranium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Total petroleum hydrocarbons- diesel	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Benzene	0.005	0.004	0.005	0.004	0.005	0.004
Ethylbenzene	0.7	0.56	0.7	0.56	0.7	0.56
Toluene	1.0	0.8	1.0	0.8	1.0	0.8
Total Xylene	10	8	10	8	10	8

[14] Metals must be analyzed as dissolved metals.

[15] Monitor = Monitoring required, but no AQL or AL will be established in the permit.

[16] Nitrate will be used only for calculation of cation/anion balance because of regional nitrate pollution and none used in processes.

[17] NE = Not Established

[18] If the gross alpha particle activity is greater than the AL or AQL, then calculate the adjusted gross alpha particle activity. The adjusted gross alpha particle activity is the gross alpha particle activity, including radium 226, and any other alpha emitters, if present in the water sample, minus radon and total uranium (the sum of uranium 238, uranium 235 and uranium 234 isotopes). The gross

TABLE 14: ANNUAL GROUNDWATER MONITORING (CONTINUED)						
Parameter	**M4-O**		**M6-GU**		**M7-GL**	
	AQL (mg/l)	AL (mg/l)	AQL (mg/l)	AL (mg/l)	AQL (mg/l)	AL (mg/l)
pH (lab)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Bicarbonate	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Calcium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Carbonate	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Chloride	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Nitrate as nitrogen 1	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Potassium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Sodium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Cation/anion balance	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Aluminum	Monitor	0.71	Monitor	0.71	Monitor	0.71
Antimony	0.006	0.005	0.006	0.005	0.006	0.005
Arsenic	0.05	0.026	0.05	0.026	0.05	0.026
Barium	2.0	1.6	2.0	1.6	2.0	1.6
Beryllium	0.0053	NE	0.004	0.0032	0.004	0.0032
Cadmium	0.040	NE	0.005	0.004	0.040	NE
Chromium (total)	0.10	0.08	0.10	0.08	0.10	0.08
Cobalt	NE	0.005	NE	0.005	NE	0.005
Copper	NE	0.51	NE	0.51	NE	0.51
Iron	NE	2.2	NE	2.2	NE	2.2
Lead	0.05	0.026	0.05	0.026	0.05	0.026
Manganese	NE	0.22	NE	0.22	NE	0.22
Mercury	0.002	0.0011	0.002	0.0011	0.002	0.0011
Nickel	0.10	0.08	0.10	0.08	0.13	NE
Selenium	0.05	0.027	0.05	0.027	0.05	0.027
Thallium	0.002	0.0016	0.002	0.0016	0.002	0.0016
Zinc	NE	2.5	NE	2.5	NE	2.5
Gross Alpha	NE	15	NE	15	NE	15
Adjusted Gross Alpha (pCi/L)	15	12	15	12	15	12
Radium 226 + 228 (pCi/L)	5	Monitor	5	4	5	4
Total Uranium Isotopes (pCi/L)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Total Uranium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Total petroleum hydrocarbons- diesel	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Benzene	0.005	0.004	0.005	0.004	0.005	0.004
Ethylbenzene	0.7	0.56	0.7	0.56	0.7	0.56
Toluene	1.0	0.8	1.0	0.8	1.0	0.8
Total Xylene	10	8	10	8	10	8

alpha analytical procedure (evaporation technique: EPA Method 900.0) drives off radon gas in the water samples. Therefore, the Adjusted Gross Alpha should be calculated using the following formula: (Laboratory Reported Gross Alpha MINUS Sum of the Uranium Isotopes).

[19] Uranium Isotope activity results must be used for calculating Adjusted Gross Alpha.

TABLE 14: ANNUAL GROUNDWATER MONITORING (CONTINUED)

Parameter	**M8-O**		**M14-GL**		**M15-GU**	
	AQL (mg/l)	AL (mg/l)	AQL (mg/l)	AL (mg/l)	AQL (mg/l)	AL (mg/l)
pH (lab)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Bicarbonate	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Calcium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Carbonate	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Chloride	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Nitrate as nitrogen	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Potassium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Sodium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Cation/anion balance	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Aluminum	NE	0.71	NE	0.71	NE	0.71
Antimony	0.006	0.005	0.016	NE	0.016	NE
Arsenic	0.05	0.026	0.05	0.026	0.05	0.026
Barium	2.0	1.6	2.0	1.6	2.0	1.6
Beryllium	0.004	0.0032	0.004	0.0032	0.004	0.0032
Cadmium	0.005	0.004	0.005	0.004	0.04	NE
Chromium (total)	0.10	0.08	0.10	0.08	0.10	0.08
Cobalt	NE	0.005	NE	0.005	NE	0.005
Copper	NE	0.8	NE	0.8	NE	0.8
Iron	NE	2.2	NE	2.2	NE	2.2
Lead	0.05	0.04	0.05	0.04	0.05	0.04
Manganese	NE	0.22	NE	0.22	NE	0.22
Mercury	0.002	0.0016	0.002	0.0016	0.002	0.0016
Nickel	0.1	0.08	0.13	NE	0.13	NE
Selenium	0.05	0.04	0.05	0.04	0.05	0.04
Thallium	0.002	0.0016	0.002	0.0016	0.002	0.0016
Zinc	NE	4	NE	4	NE	4
Gross Alpha	NE	15	NE	15	NE	1
Adjusted Gross Alpha (pCi/L)	15	12	15	12	15	12
Radium 226 + 228 (pCi/L)	5	4	5	4	5	4
Total Uranium Isotopes (pCi/L)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Total Uranium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Total petroleum hydrocarbons- diesel	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Benzene	0.005	0.004	0.005	0.004	0.005	0.004
Ethylbenzene	0.7	0.56	0.7	0.56	0.7	0.56
Toluene	1.0	0.8	1.0	0.8	1.0	0.8
Total Xylene	10	8	10	8	10	8

TABLE 14: ANNUAL GROUNDWATER MONITORING (CONTINUED)

Parameter	**M16-GU(R)**		**M17-GL**		**M18-GU**	
	AQL (mg/l)	AL (mg/l)	AQL (mg/l)	AL (mg/l)	AQL (mg/l)	AL (mg/l)
pH (lab)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Bicarbonate	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Calcium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Carbonate	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Chloride	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Nitrate as nitrogen	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Potassium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Sodium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Cation/anion balance	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Aluminum	NE	0.71	NE	0.71	NE	0.71
Antimony	0.006	0.005	0.016	NE	0.016	NE
Arsenic	0.05	0.026	0.05	0.026	0.05	0.026
Barium	2.0	1.6	2.0	1.6	2.0	1.6
Beryllium	0.004	0.0032	0.004	0.0032	0.004	0.0032
Cadmium	0.04	NE	0.005	0.004	0.04	NE
Chromium (total)	0.10	0.08	0.10	0.08	0.10	0.08
Cobalt	NE	0.005	NE	0.005	NE	0.005
Copper	NE	0.8	NE	0.8	NE	0.8
Iron	NE	2.2	NE	2.2	NE	2.2
Lead	0.05	0.04	0.05	0.04	0.05	0.04
Manganese	NE	0.22	NE	0.22	NE	0.22
Mercury	0.002	0.0016	0.002	0.0016	0.002	0.0016
Nickel	0.1	0.08	0.1	0.08	0.1	0.08
Selenium	0.05	0.04	0.05	0.04	0.05	0.04
Thallium	0.002	0.0016	0.024	NE	0.002	0.0016
Zinc	NE	4	NE	4	NE	4
Gross Alpha	NE	15	NE	15	NE	15
Adjusted Gross Alpha (pCi/L)	15	12	15	12	15	12
Radium 226 + 228 (pCi/L)	5	4	5	4	5	4
Total Uranium Isotopes (pCi/L)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Total Uranium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Total petroleum hydrocarbons- diesel	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Benzene	0.005	0.004	0.005	0.004	0.005	0.004
Ethylbenzene	0.7	0.56	0.7	0.56	0.7	0.56
Toluene	1.0	0.8	1.0	0.8	1.0	0.8
Total Xylene	10	8	10	8	10	8

TABLE 14: ANNUAL GROUNDWATER MONITORING (CONTINUED)

Parameter	M19-LBF		M20-O		M21-UBF	
	AQL (mg/l)	AL (mg/l)	AQL (mg/l)	AL (mg/l)	AQL (mg/l)	AL (mg/l)
pH (lab)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Bicarbonate	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Calcium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Carbonate	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Chloride	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Nitrate as nitrogen	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Potassium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Sodium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Cation/anion balance	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Aluminum	NE	0.71	NE	0.71	NE	0.71
Antimony	0.006	0.005	0.006	0.005	0.016	NE
Arsenic	0.05	0.026	0.05	0.026	0.05	0.026
Barium	2.0	1.6	2.0	1.6	2.0	1.6
Beryllium	0.004	0.0032	0.004	0.0032	0.004	0.0032
Cadmium	0.005	0.004	0.04	NE	0.04	NE
Chromium (total)	0.10	0.08	0.10	0.08	0.10	0.08
Cobalt	NE	0.005	NE	0.005	NE	0.005
Copper	NE	0.8	NE	0.8	NE	0.8
Iron	NE	2.2	NE	2.2	NE	2.2
Lead	0.05	0.04	0.05	0.04	0.05	0.04
Manganese	NE	0.22	NE	0.22	NE	0.22
Mercury	0.002	0.0016	0.002	0.0016	0.002	0.0016
Nickel	0.1	0.08	0.1	0.08	0.1	0.08
Selenium	0.05	0.04	0.05	0.04	0.05	0.04
Thallium	0.024	NE	0.024	NE	0.024	NE
Zinc	NE	4	NE	4	NE	4
Gross Alpha	NE	15	NE	15	NE	15
Adjusted Gross Alpha (pCi/L)	15	12	15	12	15	12
Radium 226 + 228 (pCi/L)	5	4	5	4	5	4
Total Uranium Isotopes (pCi/L)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Total Uranium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Total petroleum hydrocarbons- diesel	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Benzene	0.005	0.004	0.005	0.004	0.005	0.004
Ethylbenzene	0.7	0.56	0.7	0.56	0.7	0.56
Toluene	1.0	0.8	1.0	0.8	1.0	0.8
Total Xylene	10	8	10	8	10	8

TABLE 14: ANNUAL GROUNDWATER MONITORING (CONTINUED)

Parameter	M22-O		M23-UBF		M24-O	
	AQL (mg/l)	AL (mg/l)	AQL (mg/l)	AL (mg/l)	AQL (mg/l)	AL (mg/l)
pH (lab)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Bicarbonate	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Calcium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Carbonate	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Chloride	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Nitrate as nitrogen	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Potassium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Sodium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Cation/anion balance	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Aluminum	NE	0.71	NE	0.71	NE	0.71
Antimony	0.016	NE	0.006	0.005	0.006	0.005
Arsenic	0.05	0.026	0.05	0.026	0.05	0.026
Barium	2.0	1.6	2.0	1.6	2.0	1.6
Beryllium	0.004	0.0032	0.004	0.0032	0.004	0.0032
Cadmium	0.04	NE	0.04	NE	0.005	0.004
Chromium (total)	0.10	0.08	0.10	0.08	0.10	0.08
Cobalt	NE	0.005	NE	0.005	NE	0.005
Copper	NE	0.8	NE	0.8	NE	0.8
Iron	NE	2.2	NE	2.2	NE	2.2
Lead	0.05	0.04	0.05	0.04	0.05	0.04
Manganese	NE	0.22	NE	0.22	NE	0.22
Mercury	0.002	0.0016	0.002	0.0016	0.002	0.0016
Nickel	0.1	0.08	0.1	0.08	0.1	0.08
Selenium	0.05	0.04	0.05	0.04	0.05	0.04
Thallium	0.024	NE	0.024	NE	0.002	0.0016
Zinc	NE	4	NE	4	NE	4
Gross Alpha	NE	15	NE	15	NE	15
Adjusted Gross Alpha (pCi/L)	15	12	15	12	15	12
Radium 226 + 228 (pCi/L)	5	4	5	4	5	4
Total Uranium Isotopes (pCi/L)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Total Uranium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Total petroleum hydrocarbons- diesel	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Benzene	0.005	0.004	0.005	0.004	0.005	0.004
Ethylbenzene	0.7	0.56	0.7	0.56	0.7	0.56
Toluene	1.0	0.8	1.0	0.8	1.0	0.8
Total Xylene	10	8	10	8	10	8

TABLE 14: ANNUAL GROUNDWATER MONITORING (CONTINUED)

Parameter	M25-UBF		M26-O		M27-LBF	
	AQL (mg/l)	AL (mg/l)	AQL (mg/l)	AL (mg/l)	AQL (mg/l)	AL (mg/l)
pH (lab)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Bicarbonate	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Calcium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Carbonate	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Chloride	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Nitrate as nitrogen	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Potassium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Sodium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Cation/anion balance	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Aluminum	NE	0.71	NE	0.71	NE	0.71
Antimony	0.006	0.005	0.016	NE	0.006	0.005
Arsenic	0.05	0.026	0.05	0.026	0.05	0.026
Barium	2.0	1.6	2.0	1.6	2.0	1.6
Beryllium	0.004	0.0032	0.004	0.0032	0.004	0.0032
Cadmium	0.005	0.004	0.005	0.004	0.005	0.004
Chromium (total)	0.10	0.08	0.10	0.08	0.10	0.08
Cobalt	NE	0.005	NE	0.005	NE	0.005
Copper	NE	0.8	NE	0.8	NE	0.8
Iron	NE	2.2	NE	2.2	NE	2.2
Lead	0.05	0.04	0.05	0.04	0.05	0.04
Manganese	NE	0.22	NE	0.22	NE	0.22
Mercury	0.002	0.0016	0.002	0.0016	0.002	0.0016
Nickel	0.1	0.08	0.1	0.08	0.1	0.08
Selenium	0.05	0.04	0.05	0.04	0.05	0.04
Thallium	0.024	NE	0.002	0.0016	0.024	NE
Zinc	NE	4	NE	4	NE	4
Gross Alpha	NE	15	NE	15	NE	15
Adjusted Gross Alpha (pCi/L)	15	12	15	12	15	12
Radium 226 + 228 (pCi/L)	5	4	5	4	5	4
Total Uranium Isotopes (pCi/L)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Total Uranium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Total petroleum hydrocarbons- diesel	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Benzene	0.005	0.004	0.005	0.004	0.005	0.004
Ethylbenzene	0.7	0.56	0.7	0.56	0.7	0.56
Toluene	1.0	0.8	1.0	0.8	1.0	0.8
Total Xylene	10	8	10	8	10	8

TABLE 14: ANNUAL GROUNDWATER MONITORING (CONTINUED)

Parameter	M28-LBF		M29-UBF		M30-O	
	AQL (mg/l)	AL (mg/l)	AQL (mg/l)	AL (mg/l)	AQL (mg/l)	AL (mg/l)
pH (lab)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Bicarbonate	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Calcium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Carbonate	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Chloride	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Nitrate as nitrogen	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Potassium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Sodium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Cation/anion balance	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Aluminum	NE	0.71	NE	0.71	NE	0.71
Antimony	0.006	0.005	0.006	0.005	0.006	0.005
Arsenic	0.05	0.026	0.05	0.026	0.05	0.026
Barium	2.0	1.6	2.0	1.6	2.0	1.6
Beryllium	0.004	0.0032	0.004	0.0032	0.004	0.0032
Cadmium	0.005	0.004	0.005	0.004	0.005	0.004
Chromium (total)	0.10	0.08	0.10	0.08	0.10	0.08
Cobalt	NE	0.005	NE	0.005	NE	0.005
Copper	NE	0.8	NE	0.8	NE	0.8
Iron	NE	2.2	NE	2.2	NE	2.2
Lead	0.05	0.04	0.05	0.04	0.05	0.04
Manganese	NE	0.22	NE	0.22	NE	0.22
Mercury	0.002	0.0016	0.002	0.0016	0.002	0.0016
Nickel	0.1	0.08	0.1	0.08	0.1	0.08
Selenium	0.05	0.04	0.05	0.04	0.05	0.04
Thallium	0.024	NE	0.024	NE	0.024	NE
Zinc	NE	4	NE	4	NE	4
Gross Alpha	NE	15	NE	15	NE	15
Adjusted Gross Alpha (pCi/L)	15	12	15	12	15	12
Radium 226 + 228 (pCi/L)	5	4	5	4	5	4
Total Uranium Isotopes (pCi/L)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Total Uranium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Total petroleum hydrocarbons- diesel	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Benzene	0.005	0.004	0.005	0.004	0.005	0.004
Ethylbenzene	0.7	0.56	0.7	0.56	0.7	0.56
Toluene	1.0	0.8	1.0	0.8	1.0	0.8
Total Xylene	10	8	10	8	10	8

TABLE 14: ANNUAL GROUNDWATER MONITORING (CONTINUED)

Parameter	**M31-LBF**		**O19-GL**		**O49-GL**	
	AQL (mg/l)	AL (mg/l)	AQL (mg/l)	AL (mg/l)	AQL (mg/l)	AL (mg/l)
pH (lab)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Bicarbonate	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Calcium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Carbonate	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Chloride	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Nitrate as nitrogen	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Potassium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Sodium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Cation/anion balance	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Aluminum	NE	0.71	NE	0.71	NE	0.71
Antimony	0.006	0.005	0.006	0.005	0.006	0.005
Arsenic	0.05	0.026	0.05	0.026	0.05	0.026
Barium	2.0	1.6	2.0	1.6	2.0	1.6
Beryllium	0.004	0.0032	0.004	0.0032	0.004	0.0032
Cadmium	0.005	0.004	0.005	0.004	0.005	0.004
Chromium (total)	0.10	0.08	0.10	0.08	0.10	0.08
Cobalt	NE	0.005	NE	0.005	NE	0.005
Copper	NE	0.8	NE	0.8	NE	0.8
Iron	NE	2.2	NE	2.2	NE	2.2
Lead	0.05	0.04	0.05	0.04	0.05	0.04
Manganese	NE	0.22	NE	0.22	NE	0.22
Mercury	0.002	0.0016	0.002	0.0016	0.002	0.0016
Nickel	0.1	0.08	0.13	NE	0.1	0.08
Selenium	0.05	0.04	0.05	0.04	0.05	0.04
Thallium	0.024	NE	0.024	NE	0.024	NE
Zinc	NE	4	NE	4	NE	4
Gross Alpha	NE	15	NE	15	NE	15
Adjusted Gross Alpha (pCi/L)	15	12	15	12	15	12
Radium 226 + 228 (pCi/L)	5	4	5	4	5	4
Total Uranium Isotopes (pCi/L)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Total Uranium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Total petroleum hydrocarbons- diesel	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Benzene	0.005	0.004	0.005	0.004	0.005	0.004
Ethylbenzene	0.7	0.56	0.7	0.56	0.7	0.56
Toluene	1.0	0.8	1.0	0.8	1.0	0.8
Total Xylene	10	8	10	8	10	8

TABLE 14: ANNUAL GROUNDWATER MONITORING (CONTINUED)

Parameter	P19-1-O		P49-O		M52-UBF	
	AQL (mg/l)	AL (mg/l)	AQL (mg/l)	AL (mg/l)	AQL (mg/l)	AL (mg/l)
pH (lab)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Bicarbonate	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Calcium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Carbonate	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Chloride	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Nitrate as nitrogen	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Potassium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Sodium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Cation/anion balance	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Aluminum	NE	0.71	NE	0.71	NE	0.16
Antimony	0.006	0.005	0.006	0.005	0.006	0.0048
Arsenic	0.05	0.026	0.05	0.026	0.05	0.026
Barium	2.0	1.6	2.0	1.6	2.0	1.6
Beryllium	0.0053	NE	0.0053	NE	0.004	0.0032
Cadmium	0.005	0.004	0.005	0.004	0.005	0.004
Chromium (total)	0.10	0.08	0.10	0.08	0.10	0.08
Cobalt	NE	0.005	NE	0.005	NE	0.002
Copper	NE	0.8	NE	0.8	NE	0.8
Iron	NE	2.2	NE	2.2	NE	1.4
Lead	0.05	0.04	0.05	0.04	0.05	0.04
Manganese	NE	0.22	NE	0.22	NE	0.52
Mercury	0.002	0.0016	0.002	0.0016	0.002	0.0016
Nickel	0.13	NE	0.1	0.08	0.1	0.08
Selenium	0.05	0.04	0.05	0.04	0.05	0.04
Thallium	0.024	NE	0.002	0.0016	0.002	0.0016
Zinc	NE	4	NE	4	NE	4
Gross Alpha	NE	15	NE	15	NE	15
Adjusted Gross Alpha (pCi/L)	15	12	15	12	15	12
Radium 226 + 228 (pCi/L)	5	4	5	4	17.2	NE
Total Uranium Isotopes (pCi/L)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Total Uranium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Total petroleum hydrocarbons- diesel	Monitor	Monitor	Monitor	Monitor	Monitor	NE
Benzene	0.005	0.004	0.005	0.004	0.005	0.004
Ethylbenzene	0.7	0.56	0.7	0.56	0.7	0.56
Toluene	1.0	0.8	1.0	0.8	1.0	0.8
Total Xylene	10	8	10	8	10	8

TABLE 14: ANNUAL GROUNDWATER MONITORING (CONTINUED)

Parameter	M54-LBF		M54-O		M33-UBF (replacement)	
	AQL (mg/l)	AL (mg/l)	AQL (mg/l)	AL (mg/l)	AQL (mg/l)	AL (mg/l)
pH (lab)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Bicarbonate	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Calcium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Carbonate	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Chloride	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Nitrate as nitrogen 1	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Potassium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Sodium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Cation/anion balance	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Aluminum	NE	0.16	NE	0.16	Reserved	Reserved
Antimony	0.006	0.0048	0.006	0.0048	Reserved	Reserved
Arsenic	0.05	0.026	0.05	0.026	Reserved	Reserved
Barium	2.0	1.6	2.0	1.6	Reserved	Reserved
Beryllium	0.004	0.0032	0.004	0.0032	Reserved	Reserved
Cadmium	0.005	0.004	0.005	0.004	Reserved	Reserved
Chromium (total)	0.10	0.08	0.10	0.08	Reserved	Reserved
Cobalt	NE	0.002	NE	0.002	Reserved	Reserved
Copper	NE	0.8	NE	0.8	Reserved	Reserved
Iron	NE	1.4	NE	1.4	Reserved	Reserved
Lead	0.05	0.04	0.05	0.04	Reserved	Reserved
Manganese	NE	0.52	NE	0.22	Reserved	Reserved
Mercury	0.002	0.0016	0.002	0.0016	Reserved	Reserved
Nickel	0.1	0.08	0.1	0.08	Reserved	Reserved
Selenium	0.05	0.04	0.05	0.04	Reserved	Reserved
Thallium	0.002	0.0016	0.002	0.0016	Reserved	Reserved
Zinc	NE	4	NE	4	Reserved	Reserved
Gross Alpha	NE	15	NE	15	Reserved	Reserved
Adjusted Gross Alpha (pCi/L)	26.5	NE	26.5	NE	Reserved	Reserved
Radium 226 + 228 (pCi/L)	17.2	NE	17.2	NE	Reserved	Reserved
Total Uranium Isotopes (pCi/L)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Total Uranium (µg/L)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Total petroleum hydrocarbons- diesel	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Benzene	0.005	0.004	0.005	0.004	0.005	0.004
Ethylbenzene	0.7	0.56	0.7	0.56	0.7	0.56
Toluene	1.0	0.8	1.0	0.8	1.0	0.8
Total Xylene	10	8	10	8	10	8

Table 15: IN-SITU BADCT MONITORING

Parameter	Wells Monitored	Monitoring Frequency	Alert Level (Contingency Action)[20]	Method	Reporting Frequency
Injection Rate of well field	All Injection Wells	Daily	Monitor	Flow Meter	Monthly
Recovery Rate of well field	All Recovery Wells	Daily	Monitor	Flow Meter	Monthly
Recovered Volume to Injection Volume	Comparison of all Injection Wells and all Recovery Wells	Daily	When less than 106% of injection rate (2.6.2.6)	Flow Meter	Weekly
Inward Hydraulic Gradient	Four triplets with a triplet defined as one Recovery or Perimeter Well, one Observation Well at the edge of the ISCR well field, and one POC Well or water level well	Daily average	Less than 1-foot differential as a daily average between the Recovery/Perimeter well and the POC Well/water level well (2.6.2.6)	Transducer	Weekly
Maximum Injection Pressure	All Injection Wells	Daily	When Greater than 0.65 psi/ft. (2.6.2.7)	Pressure Gauge	Weekly
Well Bore Electrical Conductivity at Annular Conductivity Device (ACD) sensors	Measured at ACD sensors installed above MFGU or 200' above the Oxide Unit, whichever is less, on all Class III wells (Injection, Recovery, Observation and Perimeter)	Quarterly	See below (2.6.2.8)	Annular Conductivity Device	Quarterly

Well Bore Electrical Conductivity at ACD Sensor Alert Levels

Resource Block Number	Wells in Resource Block	Alert Level ((µS/cm))
045	To be determined	Reserved
054	To be determined	Reserved
063	To be determined	Reserved
053	To be determined	Reserved
062	To be determined	Reserved
TBD	To be determined	Reserved
TBD	To be determined	Reserved

Fluid Electrical Conductivity	Comparison of fluid sample collected from all Observation Wells and all Injection Wells	Daily	Observation Well conductivity equal to or greater than Injection Well conductivity (2.6.2.9)	Fluid Sample	Quarterly
Cone of Depression	Potentiometric surface map using water levels measured at all Perimeter Wells, Observation Wells, and POC Wells completed in the Oxide	Compiled Monthly	Groundwater elevation at downgradient edge of PMA boundary lower than groundwater elevation at the downgradient ISCR Observation Well (2.6.2.10)	Potentiometric Surface Map	Quarterly

[20] The permit section for the contingency requirements that correspond with each performance level is shown in parentheses.

Table 16: PTF INJECTION AND RECOVERY WELLS			
Well ID	**Latitude**	**Longitude**	**Well Status**
I-01	33°03'01.4106N"	111°26'04.6720W"	Active
I-02	33°03'00.7076N"	111°26'03.8498W"	Active
I-03	33°03'00.0141N"	111°26'04.6811W"	Active
I-04	33°03'00.7104N"	111°26'05.5078W"	Active
R-01	33°03'02.1093N"	111°26'04.6716W"	Active
R-02	33°03'01.4058N"	111°26'03.8423W"	Active
R-03	33°03'00.7075N"	111°26'03.8461W"	Active
R-04	33°03'00.0075N"	111°26'03.8533W"	Active
R-05	33°02'59.3088N"	111°26'04.6882W"	Active
R-06	33°03'00.0118N"	111°26'05.5109W"	Active
R-07	33°03'00.7156N"	111°26'06.3413W"	Active
R-08	33°03'01.4125N"	111°26'05.5074W"	Active
R-09	33°03'00.7142N"	111°26'04.6764W"	Active

Table 17: PTF OBSERVATION WELLS			
Well ID	**Latitude**	**Longitude**	**Well Status**
O-01	33°03'02.1024N"	111°26'03.8364W"	Active
O-02	33°03'01.4028N"	111°26'03.0085W"	Active
O-03	33°02'59.9258N"	111°26'03.0736W"	Active
O-04	33°02'59.2978N"	111°26'05.5135W"	Active
O-05	33°02'59.8392N"	111°26'06.5575W"	Active
O-06	33°03'01.4107N"	111°26'06.3367W"	Active
O-07	33°03'02.0881N"	111°26'05.5005W"	Active

Table 18: RESOURCE BLOCK WELLS				
Well Number	**Latitude**	**Longitude**	**Resource Block**	**Well Status**
TBD	TBD	TBD	TBD	

5.0 REFERENCES AND PERTINENT INFORMATION

The terms and conditions set forth in this permit have been developed based upon the information contained in the following, which are on file with the Department:

APP Application, dated: 6/12/2019

Contingency Plan, dated:

Final Hydrologist Report, dated:

Final Engineering Report, dated:

Public Notice, dated:

Public Hearing, dated:

Responsiveness Summary, dated:

6.0 NOTIFICATION PROVISIONS

6.1. Annual Registration Fees

The permittee is notified of the obligation to pay an Annual Registration Fee to ADEQ. The Annual Registration Fee is based on the amount of daily influent or discharge of pollutants in gallons per day (gpd) as established by A.R.S. § 49-242.

6.2. Duty to Comply

[A.R.S. §§ 49-221 through 263]

The permittee is notified of the obligation to comply with all conditions of this permit and all applicable provisions of Title 49, Chapter 2, Articles 1, 2 and 3 of the Arizona Revised Statutes, Title 18, Chapter 9, Articles 1 through 4, and Title 18, Chapter 11, Article 4 of the Arizona Administrative Code. Any permit non-compliance constitutes a violation and is grounds for an enforcement action pursuant to Title 49, Chapter 2, Article 4 or permit amendment, suspension, or revocation.

6.3. Duty to Provide Information

[A.R.S. §§ 49-243(K)(2) and 49-243(K)(8)]

The permittee shall furnish to the Director, or an authorized representative, within a time specified, any information which the Director may request to determine whether cause exists for amending or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Director, upon request, copies of records required to be kept by this permit.

6.4. Compliance with Aquifer Water Quality Standards

[A.R.S. §§ 49-243(B)(2) and 49-243(B)(3)]

The permittee shall not cause or contribute to a violation of an Aquifer Water Quality Standard (AWQS) at the applicable point of compliance (POC) for the facility. Where, at the time of issuance of the permit, an aquifer already exceeds an AWQS for a pollutant, the permittee shall not discharge that pollutant so as to further degrade, at the applicable point of compliance for the facility, the water quality of any aquifer for that pollutant.

6.5. Technical and Financial Capability

[A.R.S. §§ 49-243(K)(8) and 49-243(N) and A.A.C. R18-9-A202(B) and R18-9-A203(E) and (F)]

The permittee shall have and maintain the technical and financial capability necessary to fully carry out the terms and conditions of this permit. Any bond, insurance policy, trust fund, or other financial assurance mechanism provided as a demonstration of financial capability in the permit application, pursuant to A.A.C. R18-9-A203(C), shall be in effect prior to any discharge authorized by this permit and shall remain in effect for the duration of the permit.

6.6. Reporting of Bankruptcy or Environmental Enforcement

[A.A.C. R18-9-A207(C)]

The permittee shall notify the Director within five days after the occurrence of any one of the following:

1. the filing of bankruptcy by the permittee; or
2. the entry of any order or judgment not issued by the Director against the permittee for the enforcement of any environmental protection statute or rule.

6.7. Monitoring and Records

[A.R.S. § 49-243(K)(8) and A.A.C. R18-9-A206]

The permittee shall conduct any monitoring activity necessary to assure compliance with this permit, with the applicable water quality standards established pursuant to A.R.S. §§ 49-221 and 49-223 and §§ 49-241 through 49-252.

6.8. Inspection and Entry

[A.R.S. §§ 49-1009, 49-203(B), and 49-243(K)(8)]

In accordance with A.R.S. §§ 41-1009 and 49-203(B), the permittee shall allow the Director, or an authorized representative, upon the presentation of credentials and other documents as may be required by law, to enter and inspect the facility as reasonably necessary to ensure compliance with Title 49, Chapter 2, Article 3 of the Arizona Revised Statutes, and Title 18, Chapter 9, Articles 1 through 4 of the Arizona Administrative Code and the terms and conditions of this permit.

6.9. Duty to Modify

[A.R.S. § 49-243(K)(8) and A.A.C. R18-9-A211]

The permittee shall apply for and receive a written amendment before deviating from any of the designs or operational practices authorized by this permit.

6.10. Permit Action: Amendment, Transfer, Suspension, and Revocation

[A.R.S. §§ 49-201, 49-241 through 251, A.A.C. R18-9-A211, R18-9-A212 and R18-9-A213]

This permit may be amended, transferred, suspended, or revoked for cause, under the rules of the Department. The permittee shall notify the Groundwater Protection Value Stream in writing within 15 days after any change in the owner or operator of the facility. The notification shall state the permit number, the name of the facility, the date of property transfer, and the name, address, and phone number where the new owner or operator can be reached. The operator shall advise the new owner or operators of the terms of this permit and the need for permit transfer in accordance with the rules.

7.0 ADDITIONAL PERMIT CONDITIONS

7.1. Other Information

[A.R.S. § 49-243(K)(8)]

Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Director, the permittee shall promptly submit the correct facts or information.

7.2. Severability

[A.R.S. §§ 49-201, 49-241 through 251, A.A.C. R18-9-A211, R18-9-A212 and R18-9-A213]

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby. The filing of a request by the permittee for a permit action does not stay or suspend the effectiveness of any existing permit condition.

7.3. Permit Transfer

This permit may not be transferred to any other person except after notice to and approval of the transfer by the Department. No transfer shall be approved until the applicant complies with all transfer requirements as specified in A.A.C. R18-9-A212(B) and (C).